JUNE, 1959

Commercial Fertilizer

and PLANT FOOD INDUSTRY

HOT WEATHER HANDLING OF NITROGEN SOLUTIONS

SEE PAGE 20

Advertisement of NITROGEN DIVISION, ALLIED CHEMICAL

KRAFT BAG CORPORATION, through correct construction of your multiwall shipping sacks, will reduce seepage and spoilage of contents while minimizing your shipping and storage problems.

If your product fits into a bag –
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• St. Marys Kraft Corp.
• Gilman Paper Co.
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• Kraft Bag Corp.

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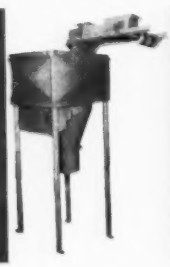
Open Mouth Bag Filling Machine provides maximum accuracy and speed. May we tell you about our stainless steel models? Remarkable in performance. Surprisingly low in price.



☐ We are interested in improving our bag.
☐ We are interested in your Kraftpacker.

CF

NAME OF COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____ PRINCIPAL_____

PRODUCT MFD._____

For 1960 . . . and beyond

13-59

fertilizer industry goals rate priority planning at SOHIO

SOHIO's success depends upon a healthy, vigorous fertilizer industry. That's one of the reasons why Sohio lends full support to activities that will benefit and strengthen fertilizer manufacturers.

Membership in the National Plant Food Institute . . . and encouraging acceptance of the following goals . . . are examples of this support.

- Improvements in fertilizer technology and a better understanding of new developments in manufacturing processes.
- Advances in chemical control methods to match continuing dynamic changes in the fertilizer industry.
- Educational and public relations programs that benefit both the fertilizer industry and agriculture.
- Encouraging research in soil science, agronomy, fertilizer economics and related fields.

These goals have always rated priority planning at Sohio. We feel that gearing our programs to match the needs of the fertilizer manufacturers has been a big factor in our growth and expansion.

And it's the reason we will continue to give priority planning to the development of improved nitrogen products, services and activities that will benefit fertilizer manufacturers . . . and the entire industry . . . today and in the future.

Call the "Man from Sohio" for details on Sohio SERVICE, and a complete line of nitrogen materials: high-quality anhydrous ammonia . . . aqua ammonia . . . 45% coated or uncoated 46% urea . . . 18 nitrogen solutions, including all urea types.

. . . we're serious about SERVICE at Sohio

SOHIO CHEMICAL COMPANY

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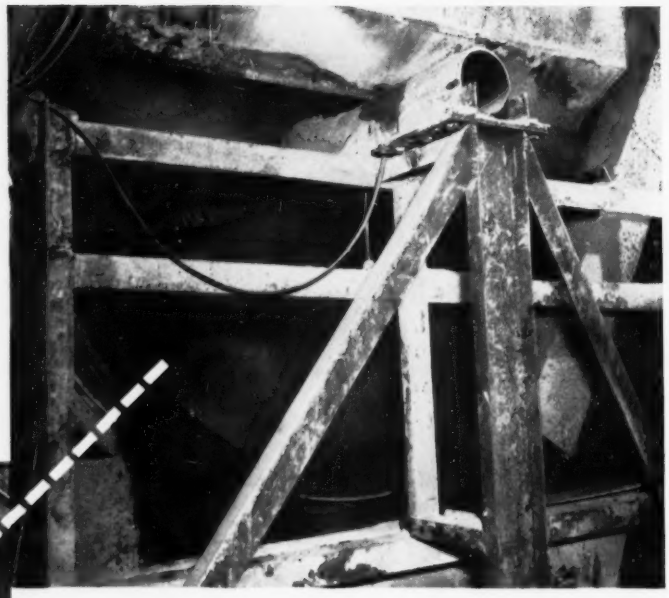
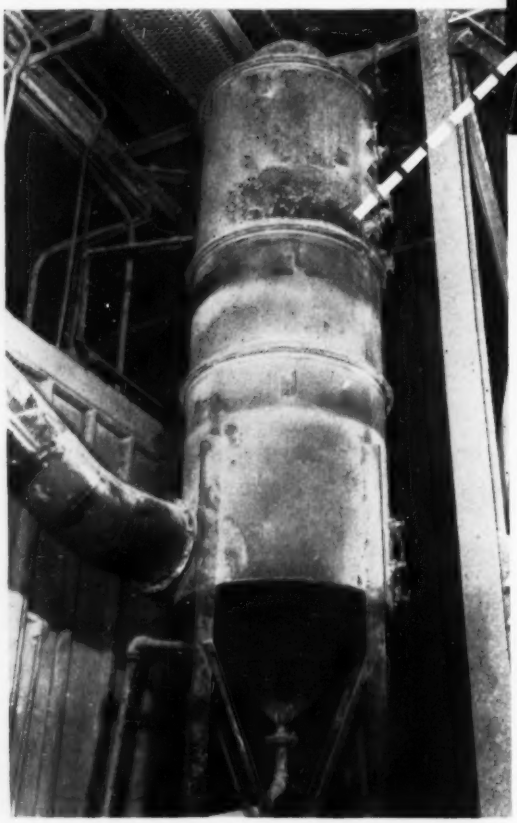
Phone CApitol 5-8015 or wire (TWX call Letters LM-497)

"STRONG" ODORS MADE SWEET AND SAFE WITH MULTI-WASH





Whether it is processing fish or fertilizer, Multi-Wash collects odors, fumes, and dusts efficiently and economically.

Applied to fertilizer processing, Multi-Wash covers all stations; ammoniators, dryers, coolers and bagging machines. No dust—no odors—no fumes to annoy workmen and plant neighbors. No danger of explosion from chemicals or combustion.

Graphic illustration shows fumes and dust in ammoniator being carried away by collector.

Water is the washing agent here, clean air is the result. The dust and fumes are washed out by turbulent scrubbing action and discharged as sludge from the bottom of the tower, where it is disposed of in a wet state.

There are no moving parts to maintain, no nozzles to clog, maintenance is minimized.

Special coatings or materials of construction can be supplied for acids, so that long life of the collector is assured. Liquids, other than water, may also be used to counteract acid conditions.

For specific application of Multi-Wash to your dust and fume problem, write or wire for our engineers' recommendations.

Refer to Sweet's File No. $\frac{1e}{5c}$

See our page in CEC

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Contents

Departments

Around the Corner 8
Of This and That 17
Research Reports 29
Grants 32
Around the Map 51
International Scene 53
Equipment News 58
Convention Calendar 62
People in the Industry 64
Changes 66
Obituaries 68
Tonnage Table 74
Advertising Index 75
Classified Advertising 76

Features

New Pan Granulator 14
Plant & Lawn Feeding 18
Study of Use Factors 23
Grass to Granules 30
Little Soil Giants 36
Consumption Table 38
Ketona's New Features 57
Michigan Soil Testing 68
Loblolly Planting 69

Meetings

Solutions Group 43
TVA Demonstration 43
Southern Control 43
NPFI 4th Annual 44
7th California 44
Pacific N.W. 45
SW Conference 46
Del-Mar-Va 70

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Commenting Freely

by BRUCE MORAN

"I was raised on a farm in Canada, but I couldn't run a farm now. The machinery they have! The fertilizers we never heard of!!" This is a quote from H. H. Alp, market development director for American Farm Bureau Federation, just back from abroad.

There are two morals in this: One—that the Federation is working to develop markets abroad. "We have been neglecting the European market" Mr. Alp says. Two—The fact that a man like Alp, working for some 1,600,000 farmers, is impressed with the complication of modern farming. Raised a farmer, he says he couldn't run a farm now.

"The fertilizers we never heard of" is a testimonial to the progress of our industry. It is also a challenge. The education needed out at the grass roots is being met by a few of us. It needs to be met, whole-heartedly, by every factor that makes the goods, that meets the farmer, that counsels him.

same day shipment

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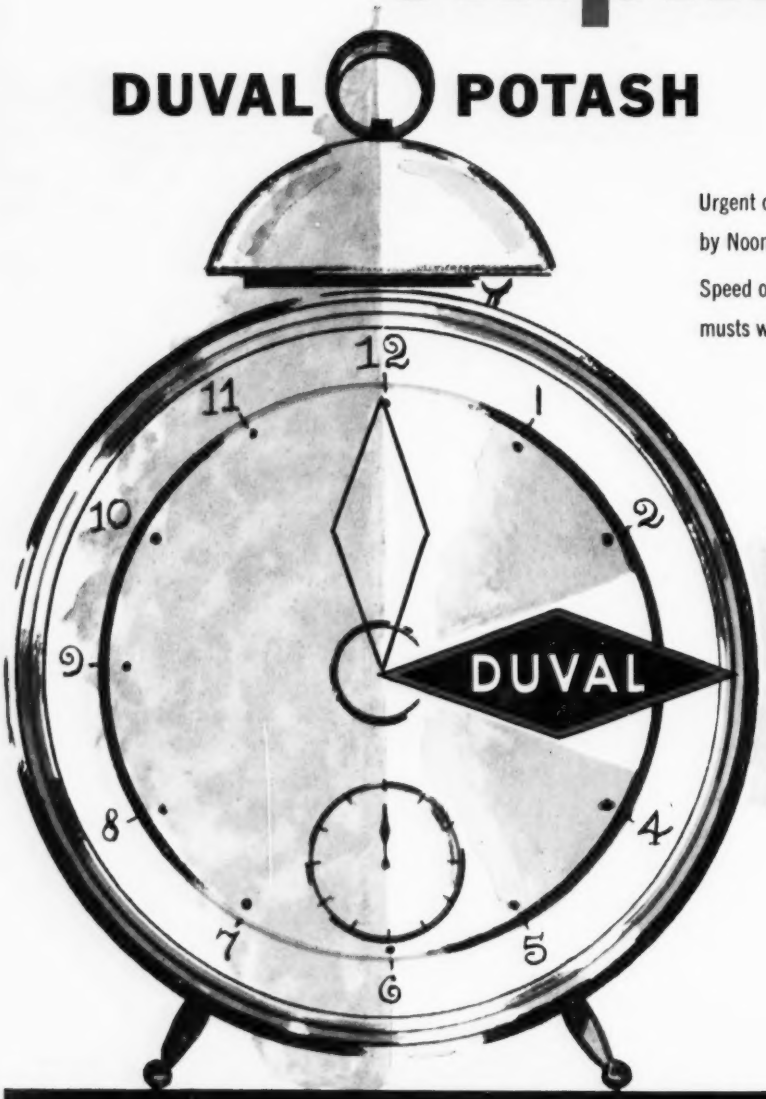

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Use Du Pont UAL-37

Growers in recent years have shown an ever-increasing interest in fertilizers that furnish slower-acting, long-feeding nitrogen. They know the value of nitrogen that nourishes plants at the rate required for maximum growth and yields—that resists leaching and remains in the root zone where plants readily absorb it.

Du Pont UAL-37 furnishes nitrogen in three forms—ammonia, soluble organic (urea), and insoluble organic. One-fifth of the nitrogen is the insoluble portion. It's of proven high agronomic value, particularly for long-season crops and grasses.

The insoluble nitrogen supplied in UAL-37 is long-feeding, of the ureaform type. Its continuous rate of nitrification yields available plant food long after soluble forms have been exhausted.

Take advantage of the growing trend toward long-feeding fertilizer materials with UAL-37. Du Pont specialists can give you at-the-plant advice, and stand ready to assist you in profitably formulating mixtures containing UAL-37. For further information on UAL-37, fill out and mail the coupon.

HERE ARE OTHER IMPORTANT ADVANTAGES OF DU PONT UAL-37

- Produces mixed goods of outstanding physical properties, because the ureaform in the mixture has a specific conditioning effect.
- Safe in granulation . . . no danger of flash fires and less stack. Gives firm, uniform, stable granules, best for storage and application.
- Suitable for either batch or continuous mixing.
- Gives mixed goods better "feel"—minimizes caking, segregation, and dusting.
- Won't corrode regular fertilizer manufacturing equipment, including ordinary steel and aluminum.
- Prompt, dependable delivery enables you to schedule your production with confidence.

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Dear Sirs: Please send me more information on UAL-37.

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JUST AROUND THE CORNER

By Vernon Mount

BOOMS have always produced a high cost of management, production – a lack of the stern control that hard times bring. It is, of course, a form of laziness. There seems no urgent need to watch pennies, – so penny by penny the costs creep up.

DELUSION exists that this won't ever happen again. It seems to me that we talked like that in the 20's, but the years following 1929 saw a tremendous job of belt-tightening. So it is very likely to happen again, because human nature has not changed much in the meantime.

INFLATION may help keep us in line. Labor rates certainly should. The squeeze between costs and going market prices should also help. And don't forget taxes – as though you could!

PERHAPS the optimists are right, and we will keep things ship-shape and Bristol fashion. That remains to be seen. But now is as good a time as any to pin a sign in your hat to remind you to keep watching.

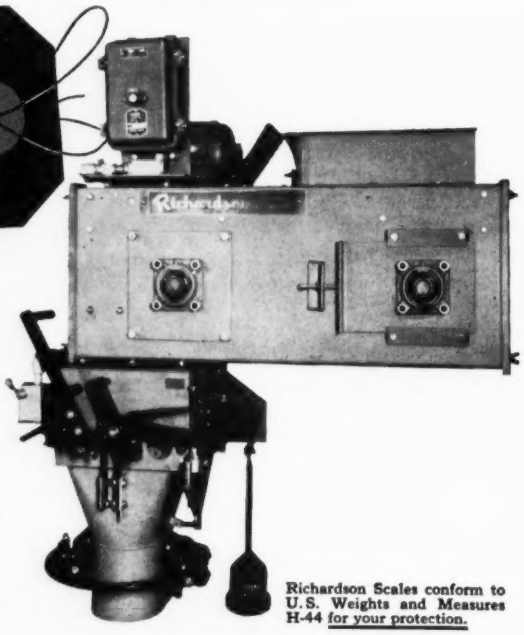
IT WILL BE EASY to forget, unless you work hard to remember.

Yours faithfully

Vernon Mount

For just $1610 a RICHARDSON GA-17 FERTILIZER SCALE

gives you modern, high-speed bagging



The low, low cost attached to this outstanding *Richardson Fertilizer Scale* makes it an ideal unit for both small and large output operations. Maximum speed with excellent accuracy assures the user of both economical bagging and elimination of "give-away."

Only the Richardson GA-17 offers the fertilizer producer all these features at this price.

- **fast, precise bagging** – up to ten 100-lb. bags per minute
- **simplicity of design** – only two units; E-10 Belt Feeder and GA-17 Bagger
- **ease of operation** – just attach the bag and pull handle
- **eye-level weight indication** – balance indicator operates on torsion principle
- **corrosion-resistant stainless steel plates** – where contact is made with fertilizer
- **minimum head-room required** – scale also available in a floor portable frame
- **service always available** – from Richardson's nationwide facilities . . . within 24 hours if desired

For higher-speed production the Richardson HA-39 provides bagging rates up to 24 bags a minute at 2 oz. accuracy.

Richardson Scales conform to U.S. Weights and Measures H-44 for your protection.

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THE MAN WITH THE ★ MULTIWALL PLAN

UNION
PACKAGING SPECIALIST
GENE CARTLEDGE

helps Multiwall user reduce bag costs $4.05 per M

In Multiwall packaging, paradoxically, it's sometimes necessary to add in order to reduce. Take the case of one leading company whose bag designs recently were analyzed by Union Packaging Specialist Gene Cartledge.

The firm uses Sewn Open Mouth Multiwalls in part of its operation. Cartledge recommended adding Union's special SEW STRONG construction (reinforcing strips at top and bottom of bag). The stronger closure enabled the basis weight of each bag to be reduced by 10#. The new sewing method led to a reduction in bag length, an improved bag design—and $4.05 per M savings! Another recommendation: convert all the firm's present Sewn Valve Multiwalls to Sewn Open Mouth types. This complete changeover will further streamline bagging and, based on the company's annual requirements, result in thousands of dollars in additional savings.

Union Multiwall Recommendations are based on this 5-Star Packaging Efficiency Plan

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

Every day, Union's 5-Star Packaging Efficiency Plan is helping packers like yourself get more for their Multiwall investment. Yet it costs nothing to put it into action. Write today for complete details.

Better Multiwall performance through better planning

union ® camp ★

UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS

UNION BAG-CAMP PAPER CORPORATION

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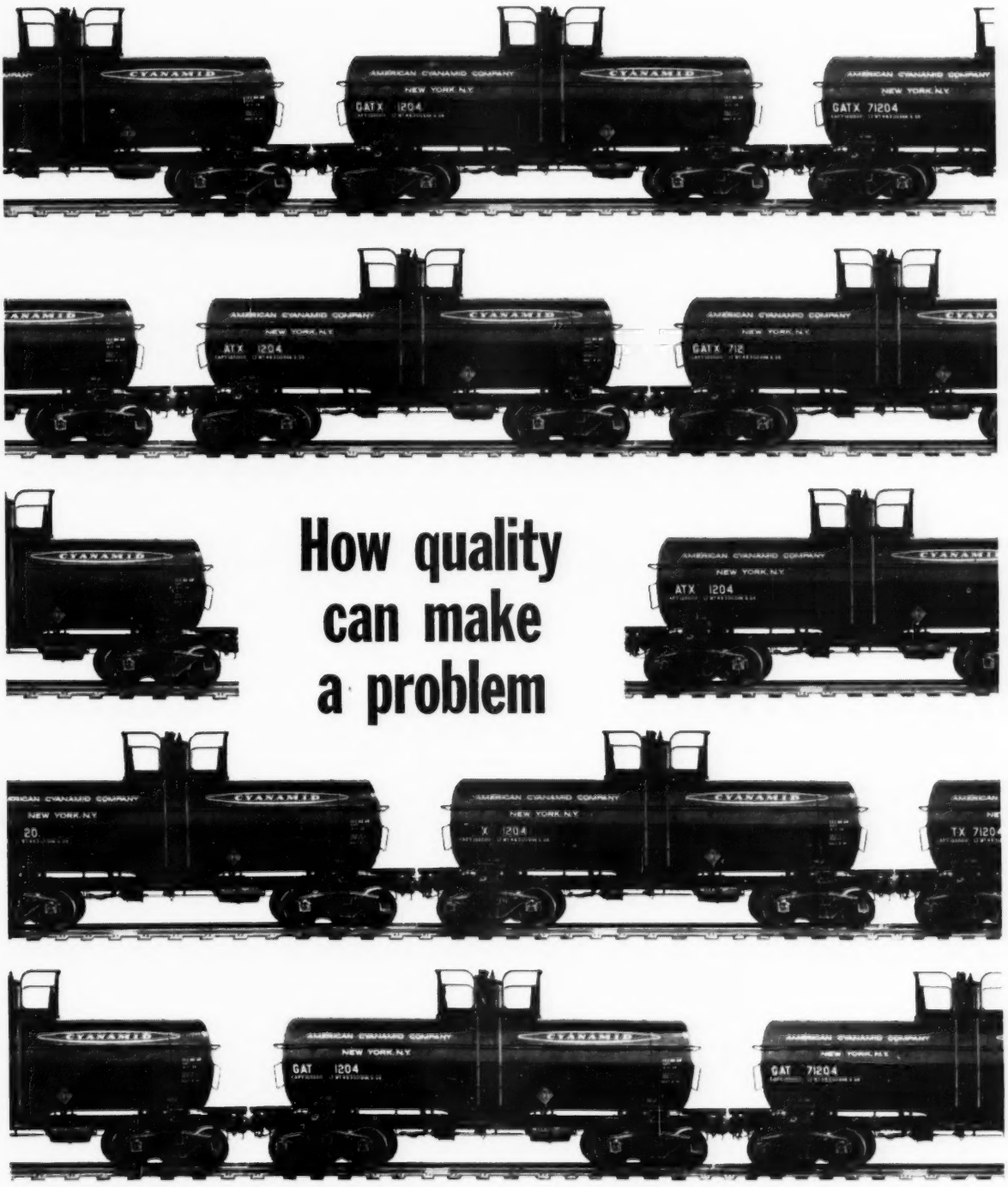


How quality can make a problem

False modesty would get us nowhere. So let's say it: we make the fertilizer industry's highest quality phosphatic fertilizer solution . . . less than 1% solids . . . less than ½ of 1% variation from 54% P_2O_5 content. Your overwhelming demand for our product has run us out of tank cars. We've ordered more. They'll be hitting the rails all summer. By September, we will have doubled the size of our fleet. Please be patient with us for a little while. As we said, quality *can* make a problem.

American Cyanamid Company, Phosphates and Nitrogen Dept., N. Y. 20, N. Y.

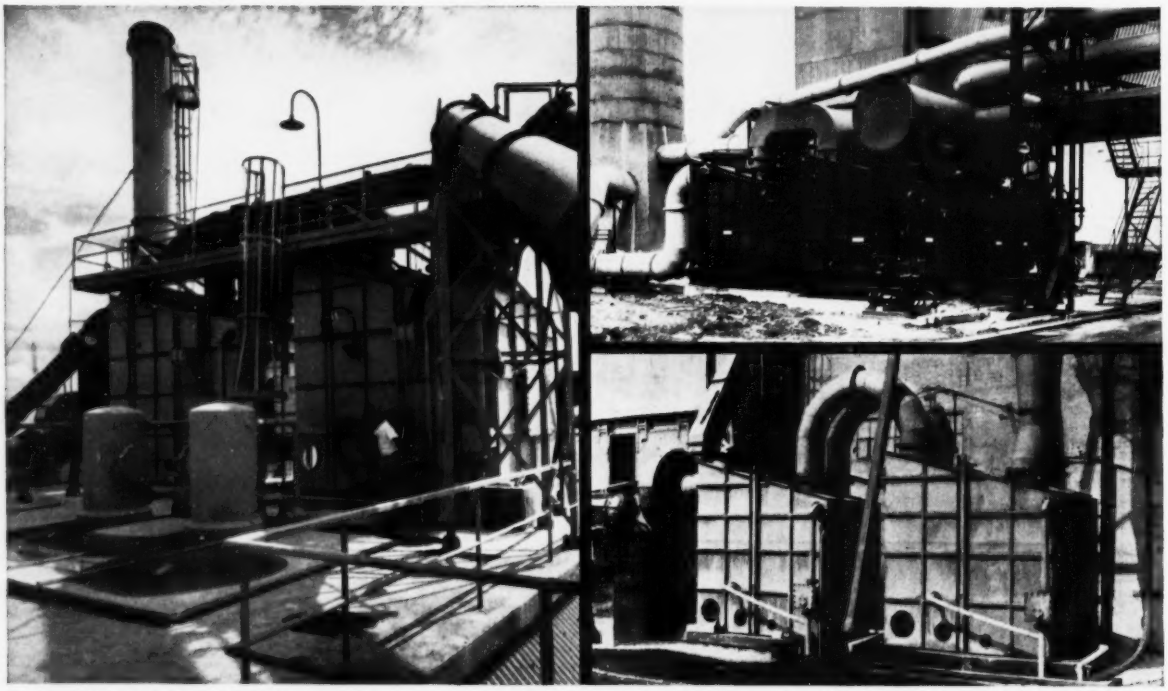
CYANAMID

PHOSPHATE PRODUCTS

typical fertilizer
plant installations
prove efficiency of the

DOYLE SCRUBBER

for removal of solids and fumes from gas streams



American Cyanamid Co., Brewster, Fla.

Top photo: Scottish Agricultural Industries, Ltd., Leith, Scotland.
Lower photo: Norske Zinkkompani A/S, Odda, Norway.

• *simple design* • *high scrubbing efficiency* • *low water requirements*

The Doyle Scrubber provides a highly efficient yet extremely simple, compact and rugged means for removing solids and fumes from gas streams. It is particularly adapted to fertilizer plant applications, including treatment of waste gases from phosphate fertilizer driers and several other operations. Its versatility is demonstrated in such additional applications as fume control in smelters, treatment of SO_2 gas prior to acid manufacture, ammonia recovery and possible use in fly ash collection.

The Doyle design makes possible high solids concentration in the scrubber effluent, a low water requirement and high heat transfer rates. Its efficiency has been conclusively proved in several installations. Doyle Scrubbers are constructed, sold and installed under license by Dorr-Oliver. They make an important addition to the extensive line of D-O equipment already offered to the fertilizer industry. For full information, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

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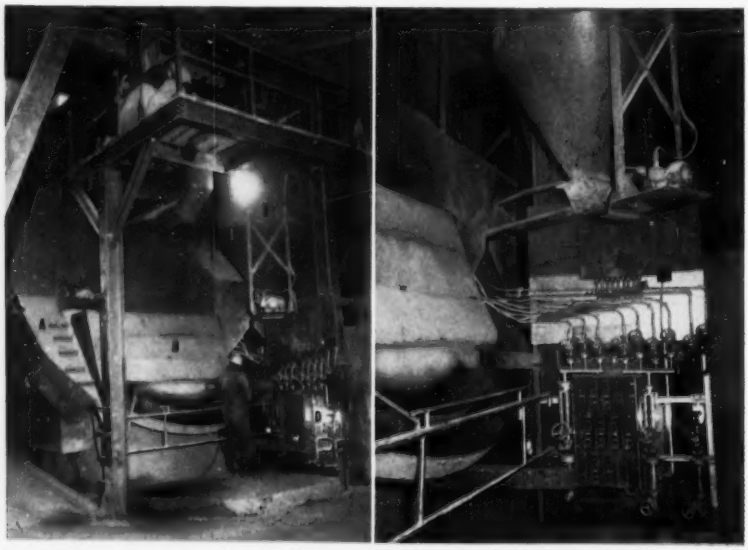
260 Madison Ave., New York 16, N. Y.

Houde

Plant of William Houde, Ltd. at LaPrairie, Quebec, near Montreal.



1. Front view of granulator from ground floor shows: compressor box (A); pan and cover (B); four-ton hopper from which coating powder is fed into pan (C); control panel (D). (to right of operator.)
2. Closeup view of control panel shows various pipes leading into individual nozzles. Coating powder is fed from hopper above panel into right side of rotating pan.

A unique pan granulator, installed in a Canadian fertilizer plant at a total cost of about $56,000 and turning out a highly uniform, spherical product at the rate of 10 tons per hour, has aroused considerable interest among U.S. manufacturers interested in granulation but stumped by the high cost of conventional installations.

Developed originally for the granulation of superphosphate, the granulator in use at the relatively small fertilizer plant of William Houde Ltd., near Montreal, is the first of this make put into production for fertilizer granulation specifically.

Installed late last fall and started immediately on production of grades popular in that area, the granulator to date has manufactured only 2-12-10, 5-10-13, and 4-24-20 fertilizer grades.

Company officials explained that there had been no opportunity to experiment with production of other grades since the equipment was installed but William Houde, president, expressed the belief that higher nitrogen grades could be produced without major difficulty.

Visiting technicians from the United States have been impressed with the simplicity of the unit, with the ease of maintenance, and with the uniformity in size, spherical shape and general high quality of the product. Only three men are required to operate the unit.

Central unit in the granulator is

About William Houde Ltd.

William Houde Ltd., located at LaPrairie near Montreal in Quebec, Canada, is a subsidiary of the French firm, North African Hyperphosphate, makers of 'Reno' brand phosphate materials.

William Houde, president, organized the company about 10 years ago, and it became a subsidiary of North African Hyperphosphate four years ago. Roland Olivier, secretary-treasurer of Houde Ltd., had been with North African Hyperphosphate for six years before coming to LaPrairie in 1955 as resident manager.

The company is a major supplier of fertilizers in its area of Quebec, where the principal crops are potatoes, tobacco (flue cured and leaf), grain, pasture hay, and truck garden products.

Because the principal demand in Quebec is for low-nitrogen grades (only an estimated 3,000 tons of fertilizer consumption in the province is above six percent nitrogen) production of granular fertilizer has been held to such grades since installation of the pan granulator there late last fall. Experimentation with higher nitrogen grades is planned after the spring production rush.

The Houde company went to granulation as demand for the granular product began spreading from the eastern part of the province, where higher humidity makes a longer-lasting, non-caking product desirable. The principals report a ready acceptance of the product, which will account for almost 25 percent of Houde's output this first year.

Installation Proves-Out

NEW PAN GRANULATOR

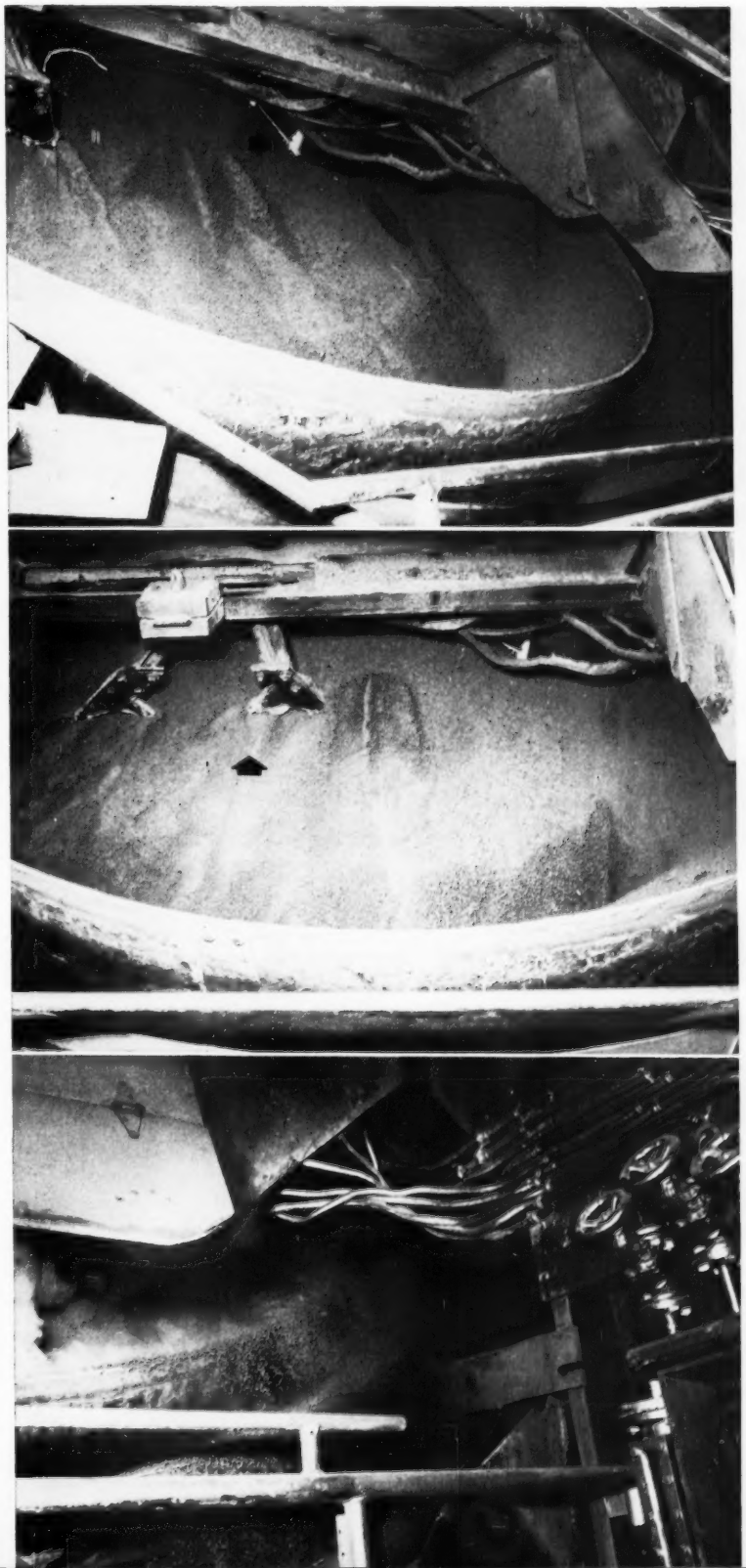
a pan not unlike a pie or cake pan, 15 feet in diameter and inclined at an angle of 45 degrees. A rim 8 inches high circles the edge of the pan, another 8-inch rim is placed 11 inches toward the center, and a 10-inch rim goes around the pan 11 inches further toward the center. The 11-foot 2-inch diameter enclosed by this innermost rim is the primary granulating area, and the two 11-inch channels between this major area and the edge of the pan are used primarily for coating the formed granules with a mixture of limestone and rock phosphate.

This pan is inclined at an angle of 45 degrees and is driven by a 20-horsepower motor through a speed reducer at a speed of 14 r.p.m. A motor-driven scraper oscillates along half of the horizontal center line, and Houde maintenance reports indicate that cleaning is needed only at weekly intervals.

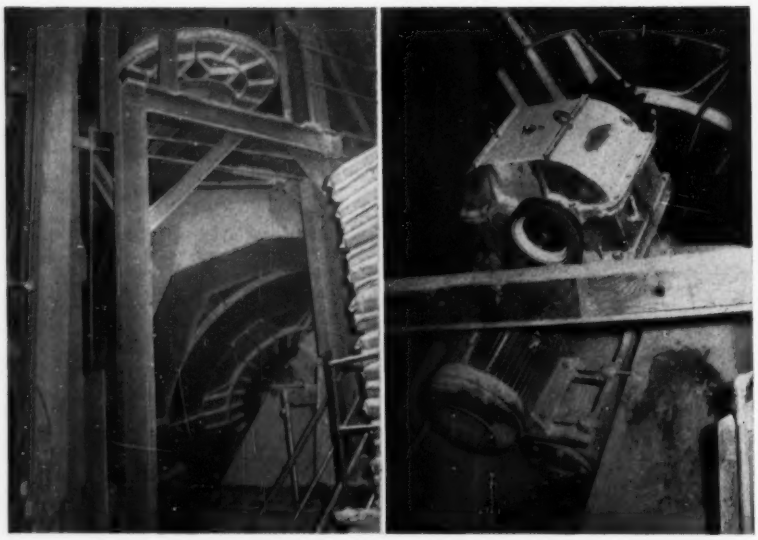
The entire pan and drive mechanism is mounted on a large concrete block and the operation is virtually free from noise and vibration.

Premixed solids are fed into the pan from overhead at the top of the vertical center line just inside the 10-inch innermost rim. Solution metered with a rotameter is sprayed into the bed from two nozzles shrouded with metal funnels about 12 inches in diameter. This shrouding permits a large area of contact between the bed surface and the solution without injecting the solution under the surface of the material. Acid is sprayed into the bed surface at the horizontal center line through three nozzles.

A home-made cover lowered over the revolving pan and a fan (about 2,000 cfm) provide adequate ventilation. There are no fumes in the working area and the odor of ammonia is not disagreeable, even above the equipment. There have



3. Shrouded nozzle (to right of arrow) is one of two which sprays solution into granulator pan. Part of oscillating scraper is shown at left. (Hood which normally covers pan during operation is raised here.)
4. Oscillating scraper (above arrow) which moves across pans horizontal center. Tubes at upper right are feed lines for liquid spray nozzles.
5. Closeup shows granulated material spilling out of center area in two 11-inch channels where they receive coating material of limestone and powdered rock phosphate.



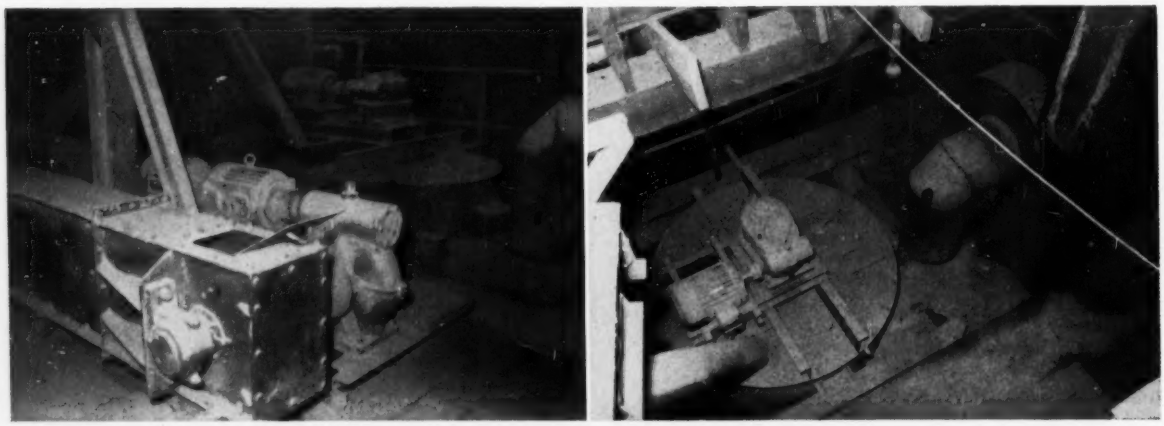
6. View shows back of inclined pan with hopper for base solids directly above (E).
7. Twenty horsepower motor drives pan granulator through a reducer gear at a speed of 14 r.p.m. This is only gear in pan arrangement, pointing up simplicity of machine.

been no complaints about fumes from the stack.

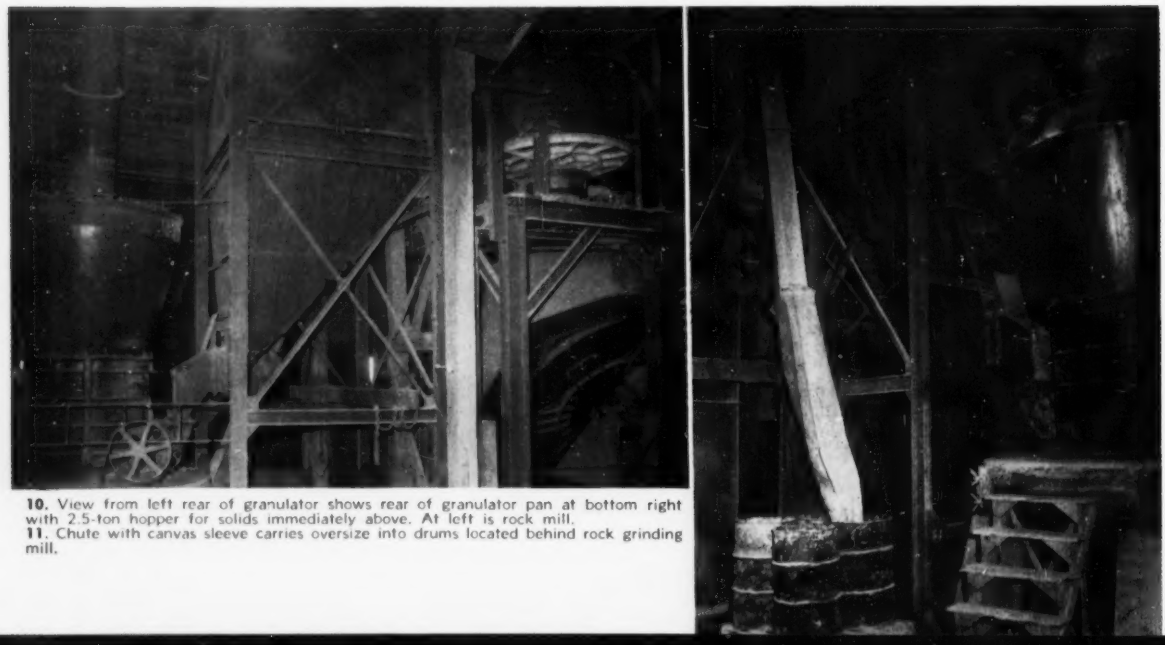
Solids are fed into the pan from a drag conveyor, which in turn is fed from a 2.5-ton hopper with a flat rotating bottom. The rate of feed into the pan can be regulated by varying the speed of the conveyor.

Granules formed within the center area of the pan are coated in the outer 11-inch channels by a mixture of limestone and rock phosphate. This mixture is fed into the channels by gravity from a 4-ton hopper with a variable speed screw that acts as a volumetric feeder.

The coated product spills over the outer rim into an elevator that carries the granular material to the top of the unit and discharges it over a 3-foot by 5-foot mechanical vibrating screen with a 4-mesh opening, the only screen used in the entire operation. Oversize is fed into a chute to drums at ground level at a surprisingly small rate of about



8. Area immediately above pan. Square unit (F) in left center background is elevator for granulated product; center background (G) is top of hopper for coating materials; in right background is exhaust stack (H) and in foreground with door open is drag conveyor (J) which feeds solids into pan.
9. View looking down on platform just above granulator shows (left) top of 4-ton hopper for coating powders, with exhaust stack and 2,000 CFM fan at right. Fumes are practically nil even directly above granulator.



10. View from left rear of granulator shows rear of granulator pan at bottom right with 2.5-ton hopper for solids immediately above. At left is rock mill.
11. Chute with canvas sleeve carries oversize into drums located behind rock grinding mill.

one percent of total production. This rejected material is later crushed and mixed with conventional pulverant fertilizer at the Houde plant.

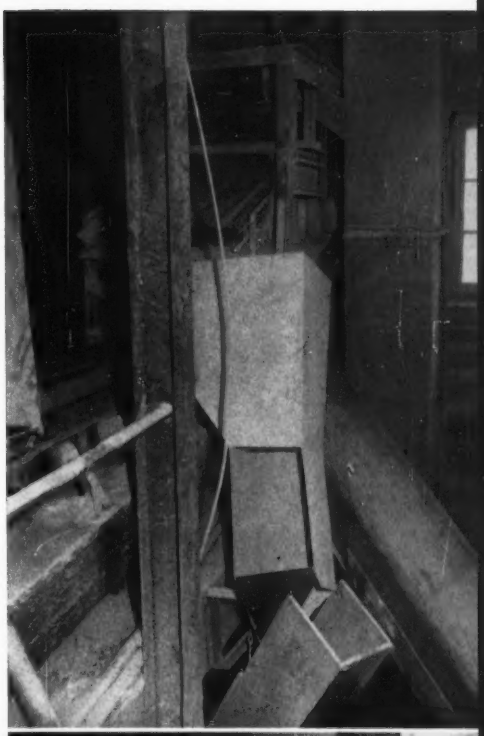
Screened material is carried to storage on a 24-inch flat conveyor belt. A simple hinged wooden paddle spreads it in a thin layer across the width of the belt, which runs through a narrow monitor area where opened windows provide the only cooling and drying used for the finished material.

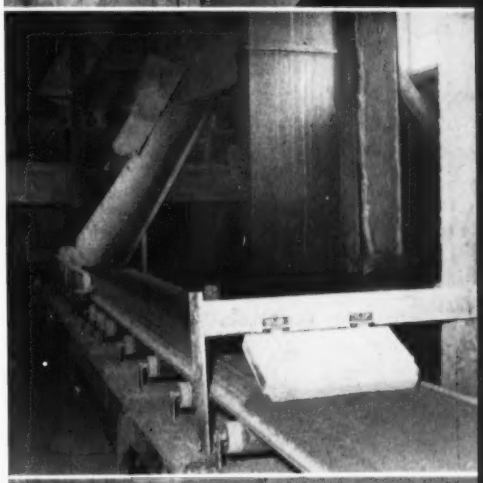
The granulating unit itself fits into a space about 22 feet long, 20 feet wide, and 37 feet high. Houde's installation costs included, beyond the granulating unit elements, an elevator at the mill where the dry base is mixed, a conveyor from the basing mill to the granulator hopper, an elevator at the granulator, a conveyor from that elevator to storage, a screen, and the necessary concrete and supporting steel work.

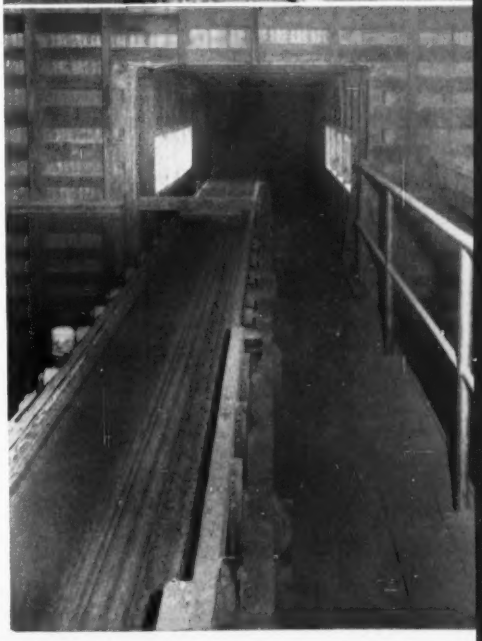
Several machines of this type are in production around the world including seven in Greece, two in Brazil, and others being installed in Poland and Chile.

This machine can be operated two machines to an elevator, thus doubling capacity with only one elevator necessary. The same type of machine is also used abroad in a smaller capacity, five to six tons, for phosphate granulation.

The machine, which has been under development for about 9 years, was introduced to the William Houde organization by North African Hyperphosphate Company, Paris, Houde's parent company. It is marketed world-wide by Dungemittel-Technik A. G. (Duetag) of Basel, Switzerland, a company formed by Chemichewerke Albert of Wiesbaden-Biebrich, Germany, the actual manufacturer, and North African Hyperphosphate. William Houde Ltd., will handle orders for Canada and the United States, through Mr. Houde and Roland Olivier, secretary-treasurer of Houde and resident manager for North African Hyperphosphate. The machine sells at $32,000 f.o.b. Hamburg. Freight to New York is about $1,000.







12. Vibrating screen at top sends oversize product (about 1 percent) down chute in foreground. Granular product goes down chute at right.
13. Typical of simplicity of entire granulating operation at William Houde plant is this simple hinged paddle which spreads finished product on conveyer belt for cooling and drying.
14. No cooling or drying equipment is necessary for product of unique pan granulator at fertilizer plant of William Houde, Ltd., near Montreal, Quebec. Finished granular product, coated with limestone and rock phosphate powder, drys and cools sufficiently in draft from windows as conveyor passes through monitor.

—of This and That . . .

_____C. N. Flanders, general manager, Plant Chem, Inc., Berkeley, Calif., writes CF that after 20 years he is retiring from the fertilizer business and is "taking that vacation." "That vacation" is a real vacation, for he says "Watch for me on your favorite T. V. Travel and Adventure program where I hope to exhibit the photographic results of a two year trip into the South American jungles, high Andes mountains, etc."

_____A J. R. Simplot Co. letterhead slogans: "It's Great Growing with Simplot Triple Superphosphate" . . . "For land sakes! Use lime" says a Georgia Lime Rock Co. (Ocala, Fla.) letterhead.

_____Nichols Seed & Fertilizer, Oklahoma City, does a nice promotion bit with a silver foil dollar-size circle with the words "$ Dollars from Nichols" on their check vouchers . . . American Agricultural Chemical Co. has a good phrase on their new soluble 17-17-17 granular package—"Treat your house plants to a square meal regularly."

_____Good news for lawn mower pushers—researcher at Beltsville, Md. say they're making progress in their search for a chemical that will retard the growth of grass. The aim: a lawn treatment that will cut mowing time to one or two afternoons a year.

_____T. C. Law, Law & Co., Atlanta, has tied for first place in the annual sample series conducted by the American Oil Chemists Society. Sharing top honors with Mr. Law in the soybean series were P. L. Phillips of Jackson, Miss., and Ben C. White, of Shreveport, La.

_____"According to the United States Department of Agriculture one ton of plant food has the same crop producing power as ten acres of land. So, the 6 million tons of plant food used today are, in fact, substituting for 60 million acres. We will need to continue to rely on plant food to substitute for our declining crop acreage."—Russell Coleman, NPFI veep, on a National Farm & Home Hour program.

_____In Colorado, legislators for the Denver area are working to protect home owners from swindling by door-to-door fertilizer salesmen who tell them they are getting quality merchandise which is actually a mixture composed mainly of sand or sawdust.

HIGH-K

MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade uniform, coarse and granular Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

61 BROADWAY • NEW YORK 6, N. Y.

Plant and Lawn

FEEDING

A witty yet clinically comprehensive brochure, devoted to fertilizer plant and lawn feeding in South Florida, by Howard C. Bardsley, B.S., horticulturist and sales manager for Florida East Coast Fertilizer Company at Homestead, Florida, is just off the press.

Entitled "Plant Feeding and You" the work, liberally illustrated by Tom Blakley's cartoons, is profitable for amateur as well as professional green thumbers.

Bardsley, graduate of the University of Rhode Island, has specialized in vegetables, flowers and ornamental plant production and turf management for the past dozen years in South Florida.

His thesis is hearteningly succinct: "You enjoy your home best when it appears in a setting of natural beauty created by a spacious, emerald-green lawn and vigorous, healthy plants, shrubs and trees. It doesn't really have to have a Cadillac out front and a mortgage that is paid; they would simply help."

For Mr. and Mrs. Newcomer To Florida, Bardsley's frank thesis should be money saving: South Florida soils contain little or no natural fertility or ability to support plants . . . except nitrogen . . . and the ability of plants to use this form of nitrogen is very limited. Even steak, as a one-food diet, would finally get monotonous . . . I guess."

The author charts lawn fertilizer application schedules and optimum maintenance application for these grasses: centipede, carpet, bahia, zoysia, St. Augustine (Bitter Blue), improved Bermudas.

Finally, the brochure gives readers an efficient landscape record sheet and lawn maintenance record form.

Arcadian® News

Volume 4 | For Manufacturers of Mixed Fertilizers | Number 6

"Thank You!"

"As the rush of the present season ends and preparation for a new fertilizer year begins, all of us here at Nitrogen Division, Allied Chemical, find this an appropriate time to say *'Thank You!'* to our customers. We appreciate your business and trust that you are pleased with our products and our service.

"Every fertilizer year is different—a unique combination of variables. However, one thing in this business is constant—the privilege of building a mutually pleasant and productive relationship with a lot of fine people. We are proud of our customers in the fertilizer industry.

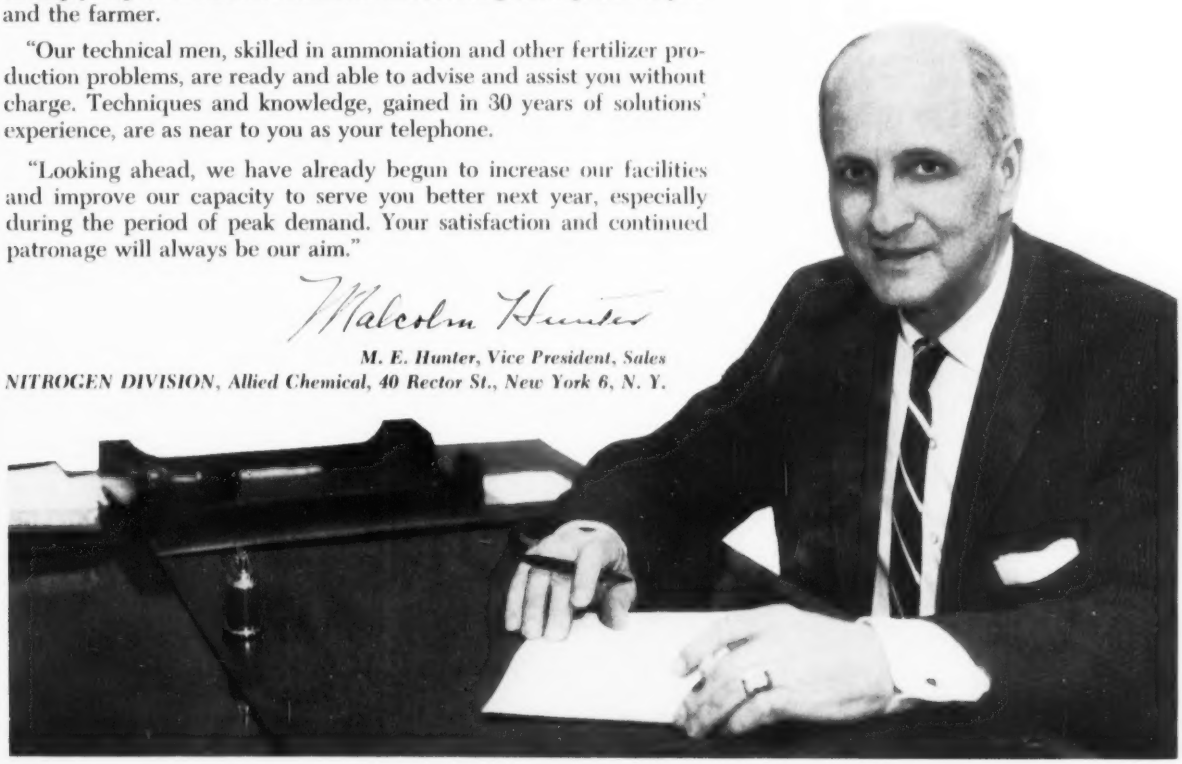
"We strive in many ways to deserve your confidence and your loyalty. We produce for you the most complete line of nitrogen materials for manufacturing fertilizers. The research that originated nitrogen solutions is constantly at work, developing new methods and materials to help you produce better fertilizers that return greater profits to you and the farmer.

"Our technical men, skilled in ammoniation and other fertilizer production problems, are ready and able to advise and assist you without charge. Techniques and knowledge, gained in 30 years of solutions' experience, are as near to you as your telephone.

"Looking ahead, we have already begun to increase our facilities and improve our capacity to serve you better next year, especially during the period of peak demand. Your satisfaction and continued patronage will always be our aim."

Malcolm Hunter

M. E. Hunter, Vice President, Sales
NITROGEN DIVISION, Allied Chemical, 40 Rector St., New York 6, N. Y.



Hot Weather Handling of Nitrogen Solutions

Producers know the many advantages of using ARCADIAN® Nitrogen Solutions for ammoniation. But it's what they *don't* know about handling these solutions that could cause trouble in the hot weather months ahead.

Boiling points of the various nitrogen solutions will differ—depending largely on their percentage of ammonia *(see thermometer chart)*—but they *all* develop relatively high vapor pressures as temperatures rise. Where this happens, serious problems can occur, such as:

Faulty performance of meters, including the simple, reliable measuring tank. Ammonia gas bubbles, present in a liquid, make meters virtually inoperative, causing inaccurate formulation and confused inventory records.

Incomplete unloading of tank cars. Gas bubbles rushing through unloading lines make the same sounds and jumping motion of the hose as caused by the flow of compressed air when the solution has been completely unloaded. This often misleads operators into thinking that unloading is completed, and they return tank cars partially filled.

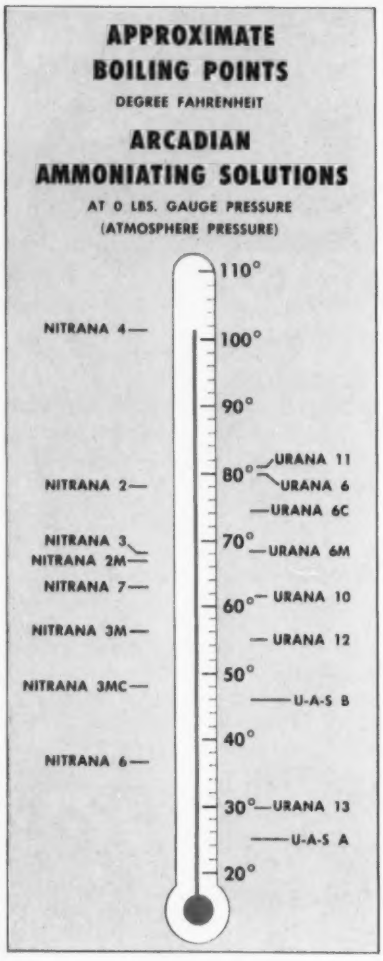
Excessive fumes during operation. The higher the vapor pressure, the greater the possibilities of trouble from ammonia fumes outside the system and from entrained bubbles inside the system.

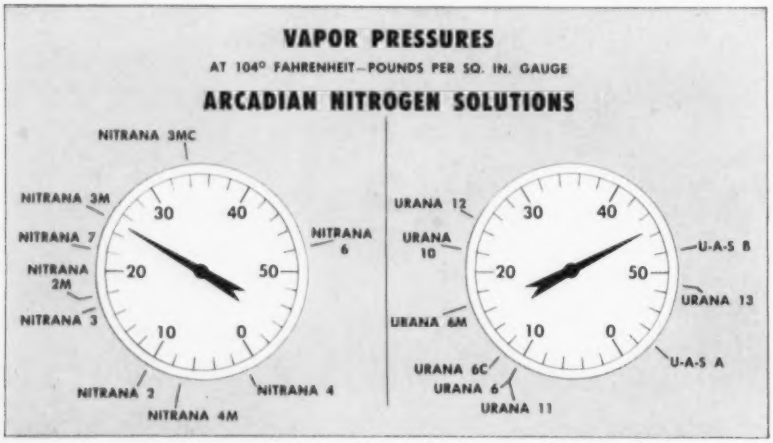
How can the producer tell that excessive vaporization has occurred? In addition to the not-always-reliable practice of "smelling" trouble in heavy fumes, there are accurate visual methods for spotting excessive vaporization. In continuous systems, the alert operator will see tell-tale gas bubbles in the rotometer. In batch systems, the bubbles show in the gauge glass. Where the system uses batch weighing of solution, the experienced operator can detect overly high vapor pressure from the longer period of time it takes to fill the measuring tank.

Excessive vaporization can be minimized to a great extent by taking steps to see that solutions are kept as cool as possible. For example, storage tanks can be shaded from the direct sun. Painting tanks white or aluminum, for heat reflection, also helps. If at all practical, a sprinkler system to spray water on tanks could be installed. In some cases, where the solution is cool when unloaded, insulated tanks would prove valuable.

However, the surest, most effective way to prevent troublesome ammonia gas from forming is to *keep air pressure higher than vapor pressure at all points in the solution handling system.* Of course, the producer must remember that flow resistance in piping and meters can absorb considerable pressure, so that the actual air pressure on the solution at some critical point in the system may be reduced enough to invite troubles from vapor. In fact, the pressure loss in the system could be great enough to permit the release of vapor at some critical point in the system. The wise producer is aware of this and adjusts his air pressure accordingly.

It goes without saying that the producer should check over his equipment and operating procedures *before* putting additional air pressure on his system in hot weather. Tanks and piping should be designed to accommodate the highest anticipated operating pressures. Tanks should be equipped with pressure relief valves to relieve any unexpected pressure build-up. And it is best to have a vacuum relief valve, as well. For where there is a temperature drop, ammonia vapors are reabsorbed by the solution, and a partial vacuum can develop. In hot weather particularly, venting of tanks during transfer of solutions should be held to a minimum, to avoid loss of nitrogen. For more information on hot weather handling of nitrogen solutions in terms of your own operation, contact: Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.



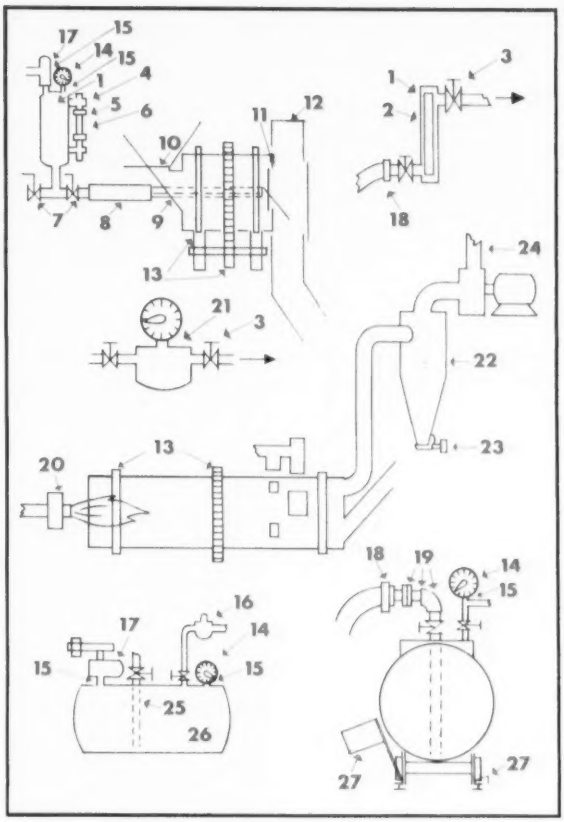


"ARCADIAN", "NITRANA", "URANA" and "U-A-S" are trade-marks of Allied Chemical Corporation.

It Pays to Check Your Equipment

Here are some of the points to check to insure safe and efficient operation:

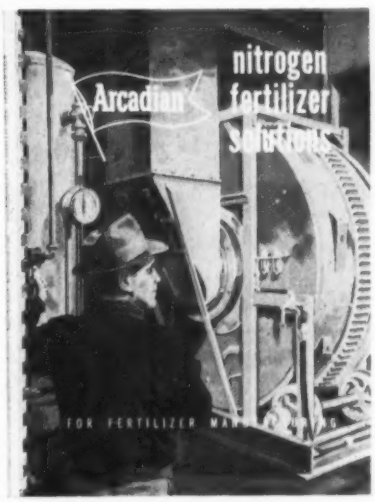
Action Needed	OK		
☐	☐	1	Measuring tanks, rotometers – use correct specific gravities.
☐	☐	2	Rotometer. Check float for wear and corrosion. Shield against breakage. Avoid mechanical strains.
☐	☐	3	Throttle on discharge side – to minimize vaporization of nitrogen solutions.
☐	☐	4	Gauge glass connections – fittings – free for easy cleaning.
☐	☐	5	Extra gaskets for gauge glasses.
☐	☐	6	Clean glass tubes. Make sure you have spare tubes.
☐	☐	7	Valves. Check for wear. Have spare parts on hand.
☐	☐	8	Rubber hose to reduce vibrations.
☐	☐	9	All distributor pipes for design and condition.
☐	☐	10	Mixer inlet gate for leakage.
☐	☐	11	Mixer discharge door for leakage.
☐	☐	12	Rotary batch mixer. Avoid suction in mixer.
☐	☐	13	Tires, trunions, ring gears and pinion for alignment, wear and safeguards.
☐	☐	14	Pressure gauges – for ammonia service? – accurate? Do not let pressure continue to rise. These are not clocks.
☐	☐	15	Location of gauges and safety valves on storage tanks. If connected into or near high velocity air line, they are not accurate during movement of air.
☐	☐	16	Pressure regulators. They are not safety devices.
☐	☐	17	Pressure and vacuum reliefs. Check operations. Remove weights unofficially added.
☐	☐	18	Hose connections. Adequate stainless steel bolted clamps.
☐	☐	19	Tank car connections. Stainless steel and short for strength and permanence. Use elbows to avoid hose kinks.
☐	☐	20	Dryer burner – clean, adjust, and check controls.
☐	☐	21	Displacement meters. Lose accuracy at low rate of flow and with gas bubbles.
☐	☐	22	Dust collector. Check for condensation, caking, deterioration, overloading. Clean fan blades.
☐	☐	23	Check for air leaks at dust collector discharge.
☐	☐	24	Stacks. Check for fouling and corrosion.
☐	☐	25	Storage tank dip pipes. Check for leaks.
☐	☐	26	Tanks. Check for weakening by corrosion, and failure of any coating or lining.
☐	☐	27	Tank cars. Always blue flag and block wheels.



OTHER PRECAUTIONS: Make sure operators have proper training and instruction. Equip them with rubber gloves and goggles. Have good lighting and safe exits. Keep safety literature handy. Have gas masks and a supply of water for emergencies. Emergency shower baths should be freeze-proof and warm for cold weather.

SEND FOR YOUR COPY

The ARCADIAN® manual on Nitrogen Fertilizer Solutions is packed with useful information. If you do not have a copy, obtain yours from: Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y.



HERE'S THE BIG LINE OF Arcadian® NITROGEN SOLUTIONS

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

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Allied Chemical

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STUDY OF FERTILIZER USE FACTORS

FARM CHARACTERISTICS AND USE OF CREDIT AS RELATED TO FERTILIZER IN ALABAMA

by J. H. YEAGER *and* O. D. BELCHER
Alabama Polytechnic Institute

. . . In spite of the tremendous increases in fertilizer use, there is little information on the role of credit and the relationship of various factors to the use of fertilizers and the acceptance of new fertilizers and fertilizer practices by farmers in the South.

The cooperative study in Alabama was started in 1957. It was the purpose of the study to obtain information from farmers, fertilizer dealers, credit agency representatives and others in order to find out some of the facts about fertilizer use and acceptance and the role played by credit.

Presented at Conference for Cooperators in the TVA Agricultural Economics Research Activities, Knoxville, Tennessee, March 24-26, 1959.

Sample of Farms

In the sampling process of selecting farms, seven counties were not included in the universe. These were counties in which less than 30 per cent of the farmers operated commercial farms as defined by the Census, and Mobile and Baldwin Counties in which truck crops account for an important segment of agricultural production. The remaining counties were grouped according to generalized types of farming areas in the State. Two counties were randomly selected to represent each type of farming area. Within the counties selected, areas and segments within areas were delineated. Sample segments were randomly selected and all farm operators whose headquarters were within the segment boundaries were interviewed. To qualify as a farmer, the operator must have had $200 or more of farm income in 1957.

A total of 463 usable farm questionnaires were completed by personal interview with farmers in 16 counites. In addition 41 dealers or merchants who handled fertilizer and officials of 33 banks, 4 Production Credit Associations, and 4 Farmers Home Administration offices were interviewed. Some of the findings in analyses of the data from farmers are reported in the following tables and discussion.

Some significant differences were found in characteristics of farms, fertilizer use and practices by types of farming areas.

Table 1. Number of Farms, Average Size, Average Age of Farm Operators, and Percentage Colored Operators, by Farming Areas

Area	Number	Average size (acres)	Average age (years)	Colored (%)
T. V.	66	120	48	4
Sand Mt.	66	80	51	0
Limestone V.	60	160	49	2
U. C. P.	63	121	52	30
Piedmont	29	214	52	10
Black Belt	59	402	52	85
L. C. P. (West)	61	254	52	15
L. C. P. (East)	59	299	51	22
State	**463**	**202**	**51**	**21**

Table 2. Percentage of Farm Operators Who Had Completed Various Levels of Formal Education, by Farming Areas

Area	Years of formal education				
	None	1 to 6	7 to 12	Over 12	Not reported
	%	%	%	%	%
T. V.	6	21	70	3	0
Sand Mt.	0	33	61	6	0
Limestone V.	5	35	57	3	0
U. C. P.	8	29	57	6	0
Piedmont	3	21	72	4	0
Black Belt	20	41	30	7	2
L. C. P. (West)	5	39	52	3	0
L. C. P. (East)	8	32	59	0	0
State	**7**	**32**	**57**	**4**	[1]

[1] Less than 1 per cent.

Table 3. Percentage of Farmers According to Tenure Class, By Farming Areas

Area	Tenure class				
	Full owner	Part owner	Share tenant	Cash tenant	Standing renter
	%	%	%	%	%
T. V.	38	35	24	0	3
Sand Mt.	47	38	14	2	0
Limestone V.	53	22	17	0	8
U. C. P.	64	19	5	11	2
Piedmont	55	17	17	4	7
Black Belt	10	15	17	46	12
L. C. P. (West)	39	33	12	7	10
L. C. P. (East)	39	30	19	8	3
State	**42**	**27**	**16**	**10**	**5**

Description of Farms

Farm in the Black Belt were about twice as large in terms of total acres as the average of all farms in the State (Table 1). Eighty-five per cent of the farmers in this area were colored. Farms in the Sand Mountain Area averaged 80 acres. The average age of all farm operators was 51 years.

More than one-half of all farmers had completed between 7 and 12 grades of formal education (Table 2). Only 4 per cent had completed more than 12 grades.

Three-fourths of the farm operators in the Black Belt Area were tenants compared with only 16 per cent in the Sand Mountain Area (Table 3). The high percentage tenure in the Black Belt is associated with the predominance of colored farmers in this area. Full owners as defined in the study were those operators that owned land and did not rent in additional land. Part owners both owned and rented in land.

The 1954 Census of Agriculture indicated that 35 per cent of all farmers were tenants. This compares with 31 per cent in the sample of 463 farmers.

Levels of Fertilizer Use

Farmers in the Sand Mountain, Limestone Valleys, and Lower Coast-

al Plains farming areas used the most nitrogen, phosphate, and potash on cotton and corn in 1957 (Tables 4, 5, and 6). Ninety-eight per cent of the farmers in all areas used all three major fertilizer elements on cotton. However, in the Black Belt Area, 95, 78, and 73 per cent of all farmers used nitrogen, phosphate, and potash respectively on corn.

The average amounts of nitrogen, phosphate, and potash used on cotton is more nearly in line with general fertilizer recommendations than the average amounts used on corn. Only in the Sand Mountain Areas was an average of more than 50 pounds of nitrogen per acre applied to corn in 1957.

Fertilization of hay and pasture was at a level far below that of cotton and corn. Only one-third of the farmers with hay and pasture applied any nitrogen, 45 per cent applied phosphate, and 43 per cent applied potash in 1957. The average amount of all three fertilizer elements applied to hay and pasture was greatest in the Lower Coastal Plains Areas. This may be related to the use of coastal bermuda and bahia grass as forages in these areas.

More than 50 per cent of the farmers in the Lower Coastal Plains (East) Area reported the use of nitrogen on peanuts although this is not a recommended practice. Experiments conducted over a period of many years by the Alabama Agricultural Experiment Station have failed to give an increased yield of peanuts as the result of nitrogen applications. The reason given by farmers for the use of nitrogen on peanuts was to get the young plant off to a good start well ahead of weeds and grass.

The average amount of nitrogen, phosphate, and potash purchased per farm reporting purchases in 1957 was 1,990, 2,306, and 2,111 pounds respectively. Approximately 90 per cent of the farmers in all areas except the Upper Coastal Plains reported purchases of the three plant nutrients. Purchases per farm in the Lower Coastal Plains Areas were from 2 to 3½ times as great as those in other areas.

Factors Related to Level of Fertilizer Use

Limited study has been made of four variables and the degree to which these variables are associated with rates of fertilization on cotton and corn. The variables are tenure, age of farm operator, years of formal education of the farm operator, and acres operated (size of farm) in 1957. Further analysis of the data will yield other variables that should be studied to determine their degree of association with fertilizer use.

Owners were found to have used an average of about 20 pounds of plant food per acre more on cotton and about 30 pounds more on corn than tenants, Table 7. These figures are for all farmers included in the study regardless of farming area. Part owners who as an average operated larger farms and were younger than owners used more plant food per acre on cotton and corn than did owners. As would be expected, owners and part owners were in a stronger financial position (as represented by their average net worth) than tenants.

About one-third of the owners had ever had any soil tested on their farm compared to 27 per cent of the share tenants and only 13 per cent of the cash and standing tenants. (See Appendix Table A for detailed data according to tenure groups.)

As the average age of farm operators increased, lower rates of fertilization were used on cotton (Table 8). There appeared to be little relationship of fertilization rates for corn to age of the farm operator. The fact that older farmers used less fertilizer on cotton is not likely linked with the tenure factor. As age increased the data show a higher percentage of farmers to be owners. (See Appendix Table B.)
er

Thirty-nine per cent of all farmers in the study had less than 7 years of formal education (Appendix Table C). Average size of farm operated and average net worth of the farm operator were found to increase as

Table 4. Percentage of Farmers Reporting the Use of and Average Amount of Nitrogen Used Per Acre on Selected Crops, by Farming Areas

	Crop					
	Cotton		Corn		Hay and pasture	
Area	%	Pounds	%	Pounds	%	Pounds
T. V.	100	43	97	24	16	2
Sand Mt.	100	66	100	57	21	2
Limestone V.	95	60	98	49	28	2
U. C. P.	98	41	100	33	22	3
Piedmont	100	52	100	38	48	4
Black Belt	98	43	95	29	18	1
L. C. P. (West)	100	56	98	45	59	17
L. C. P. (East)[1]	100	47	100	44	54	10
State	**99**	**51**	**98**	**40**	**32**	**5**

[1] On peanuts, 51 per cent of the farmers reported the use of nitrogen; average amount used per acre was 7 pounds.

Table 5. Percentage of Farmers Reporting the Use of and Average Amount of Phosphate Used Per Acre on Selected Crops, by Farming Areas

	Crop					
	Cotton		Corn		Hay and pasture	
Area	%	Pounds	%	Pounds	%	Pounds
T. V.	100	44	98	26	39	8
Sand Mt.	100	70	100	27	34	10
Limestone V.	100	60	100	32	52	6
U. C. P.	100	48	93	22	24	6
Piedmont	100	47	96	26	48	6
Black Belt	98	49	78	19	30	2
L. C. P. (West)	100	59	98	33	55	19
L. C. P. (East)[1]	100	49	100	29	74	21
State	**100**	**54**	**96**	**27**	**45**	**10**

[1] On peanuts, 98 per cent of the farmers reported the use of P_2O_5; average amount used per acre was 39 pounds.

Table 6. Percentage of Farms Reporting the Use of and Average Amount of Potash Used Per Acre on Selected Crops, by Farming Areas

	Crop					
	Cotton		Corn		Hay and pasture	
Area	%	Pounds	%	Pounds	%	Pounds
T. V.	100	40	98	20	38	8
Sand Mt.	100	66	100	22	33	12
Limestone V.	100	56	100	25	52	7
U. C. P.	100	38	93	18	24	5
Piedmont	100	39	96	19	38	6
Black Belt	98	41	73	15	30	2
L. C. P. (West)	100	55	98	27	55	17
L. C. P. (East)	100	61	100	23	72	22
State	**100**	**50**	**95**	**21**	**43**	**10**

years of formal education increased. The percentage tenants decreased with increases in years of education.

More than one-half the farmers with 12 years or more of formal education had had their soil tested compared with 30 per cent of all farmers. Higher levels of nitrogen, phosphate, and potash use on both cotton and corn were associated with level of formal education (Table 9).

The fourth factor investigated as to its relationship to fertilizer use was size of farm operated in 1957. A significant correlation, although not tested statistically, appeared to exist in rate of N, P, and K used per acre on cotton and corn and size of farm (Table 10). This relationship is stronger for corn than cotton. As size of farm increased, most of the increase in fertilizer used per acre on cotton was in the amount of potash. For corn, all three elements increased as size of farm increased.

There was very little difference in the average age of operators on small and large farms, Appendix Table D. However, as size of farm increased the average percentage of farmers who had soil tested increased, the percentage of farmers who were tenants decreased, and the percentage of operators with seven years or more of formal education increased.

Table 7. Average Amount of Nitrogen, Phosphate, and Potash Used Per Acre on Cotton and Corn According to Tenure of Farm Operator

Item	Tenure				All farms
	Full owners	Part owners	Share tenants	Cash and standing tenants	
Average pounds used per acre on cotton:					
N	50	53	45	45	51
P_2O_5	55	57	52	47	54
K_2O	51	56	48	41	50
Total	**156**	**166**	**145**	**133**	**155**
Average pounds used per acre on corn:					
N	41	46	38	28	40
P_2O_5	30	30	22	18	27
K_2O	24	24	17	15	21
Total	**95**	**100**	**77**	**61**	**88**

Table 8. Average Amount of Nitrogen, Phosphate, and Potash Used Per Acre on Cotton and Corn According to Age of Farm Operators

Item	Age of farm operator					All farms
	Less than 40	40 to 49	50 to 59	60 to 69	70 and over	
Average pounds used per acre on cotton:						
N	55	49	48	48	40	51
P_2O_5	55	56	54	51	46	54
K_2O	49	51	54	45	39	50
Total	**159**	**156**	**156**	**144**	**125**	**155**
Average pounds used per acre on corn:						
N	41	41	39	39	38	40
P_2O_5	27	27	26	27	32	27
K_2O	22	21	21	21	24	21
Total	**90**	**89**	**86**	**87**	**94**	**88**

Table 9. Average Amount of Nitrogen, Phosphate, and Potash Used Per Acre on Cotton and Corn According to Years of Formal Education of Farm Operator

Item	Years of formal education				All farms
	None	1-6	7-12	Over 12	
Average pounds used per acre on cotton:					
N	39	50	49	61	51
P_2O_5	38	55	54	67	54
K_2O	34	52	51	59	50
Total	**111**	**157**	**154**	**187**	**155**
Average pounds used per acre on corn:					
N	24	38	42	56	40
P_2O_5	19	24	29	39	27
K_2O	15	19	23	32	21
Total	**58**	**81**	**94**	**127**	**88**

Table 10. Average Amount of Nitrogen, Phosphate, and Potash Used Per Acre on Cotton and Corn According to Size of Farm

Item	Total acres operated					All farms
	Less than 50	50 to 99	100 to 149	150 to 299	300 and over	
Average pounds used per acre on cotton:						
N	49	49	46	52	50	51
P_2O_5	55	53	50	56	54	54
K_2O	47	49	49	54	58	50
Total	**151**	**151**	**145**	**162**	**162**	**155**
Average pounds used per acre on corn:						
N	35	36	40	44	51	40
P_2O_5	22	26	28	30	35	27
K_2O	17	22	21	23	31	21
Total	**74**	**84**	**89**	**97**	**117**	**88**

Soil Tests

For all farmers included in the study, 30 per cent stated they had had soil tested at some time. Only 42 out of 463 or 9 per cent reported having soil tested in 1957.

Cotton was planted in 50 per cent of the fields after soil was tested in 1957. Corn was planted in 31 per cent, peanuts in 17 per cent, and hay or pasture in 10 per cent of the fields after soil was tested in 1957.

Eleven out of 42 farmers reported they did not follow the soil test recommendations. Six of the 42 farmers had not received the results from their soil test as of the date they were interviewed. Some reasons given for not following soil test recommendations were that the landlord would not "go along," weather did not permit, and the farmer had no faith in the recommendations.

Use of Credit for Fertilizer Purchases

Interviews with farmers and credit agencies disclosed that granting of credit for fertilizer purchases was similar to that for feed, insecticides and other items entering directly into farm production.

Fifty-seven per cent of the farmers borrowed in 1957 for fertilizer purchases. Ninety-two per cent of the farmers in the Black Belt Area borrowed to buy fertilizer. Only 34 per cent of those in the Piedmont and 38 per cent in the Sand Mountain Area borrowed for fertilizer purchases. Commercial banks, dealers, and landlords accounted for 84 per cent of the fertilizer credit sources used (Table 11).

Farmers in the Tennessee Valley,

Sand Mountain and Coastal Plains Areas relied most heavily on commercial banks. Those in the Limestone Valley and Piedmont Areas depended more heavily on fertilizer dealers for credit than farmers in other areas. Thirty day account sales were not included in the credit category.

Farmers in the Black Belt, due to tenure arrangements, relied primarily on landlords for fertilizer credit. A number of landlords in the Black Belt sold to persons other than their tenants. In this case, the landlord was classified as a dealer.

Farmers were asked if they knew of a source of fertilizer credit other than the one they used. Fifty-nine per cent stated that they knew of no other source. Those that knew of other sources most frequently mentioned a commercial bank or fertilizer dealer.

Table 11. Percentage of Farmers Reporting Use of Various Sources of Fertilizer Credit

Area	Source of credit						
	Commercial bank	Dealer	Landlord	PCA	FHA	Individual[1]	Other
	%	%	%	%	%	%	%
T. V.	58	22	3	14	3	0	0
Sand Mt.	48	24	0	12	8	4	4
Limestone V.	27	46	12	0	12	4	0
U. C. P.	33	33	10	6	10	8	0
Piedmont	20	40	40	0	0	0	0
Black Belt	15	28	55	0	0	2	0
L. C. P. (West)	59	22	16	3	0	0	0
L. C. P. (East)	38	10	15	25	2	5	5
State	**37**	**27**	**20**	**8**	**4**	**3**	**1**

[1] Individual other than landlord.

Table 12. Number of Farmers Reporting the Use of Credit from Various Sources, Range in Rate of Interest, and Average Rate of Interest Paid

Source of credit	Number of farmers	Interest rate paid[1]	
		Range	Average
		%	%
Commercial bank	90	6 - 19	7.3
Dealer	48	0 - 18	6.3
Landlord	28	0 - 48	11.1
Production Credit Association	20	3 - 6[2]	6.0
Farmers Home Administration	10	5 - 6	4.9
Individual[3]	7	0 - 14	5.6
Other	3		7.0

[1] Rate of interest calculated on an annual basis.
[2] The 3 per cent considers the dividend received on stock.
[3] Individual other than landlord.

Table 13. Percentage of Farmers Reporting Various Cost Bases Considered in Deciding on Kind and Amount of Fertilizer To Buy, by Farming Areas

Area	Cost considered				
	Per ton	Per pounds of plant food	Per bag	Δ cost / Δ return	Not reported
	%	%	%	%	%
T. V.	69	18	8	5	0
Sand Mt.	28	48	8	12	4
Limestone V.	64	27	3	6	0
U. C. P.	60	40	0	0	0
Piedmont	65	21	7	7	0
Black Belt	80	10	5	5	0
L. C. P. (West)	70	22	8	0	0
L. C. P. (East)	71	26	0	3	0
State	**64**	**26**	**5**	**4**	[1]

Table 14. Number and Percentage of Farmers Reporting Various Reasons for the Preference of Ammonium Nitrate and Nitrate of Soda

Item	Number of farmers	Percentage
Preferred ammonium nitrate	**185**	**40**
Reason:		
Higher percentage N	55	30
Better results	45	24
Cheaper per pound of N	44	24
Other	38	21
Not reported	3	1
Preferred nitrate of soda	**168**	**36**
Reason:		
Always used this source	65	39
Better results	31	18
Easier to apply	26	16
Non-acid forming	10	6
Other	32	19
Not reported	4	2

Data on amount borrowed, date borrowed, interest paid, and date loan was repaid were obtained from farmers who used credit for fertilizer purchases. Thus the annual rate of interest paid could be calculated. Interest rates averaged 11 per cent on loans from landlords (Table 12). The second highest average rate of interest was on loans from commercial banks.

Farmers reported borrowing money in the spring for purchases of fertilizer, seed, and other items. On the other hand, very few farmers borrowed funds in the fall for fertilizer purchases. Apparently, fertilizer purchases for fall-seeded crops are financed out of funds from the sale of harvested crops.

Decisions in Connection with Fertilizer Purchases

More than half of the farmers included in the study reported checking fertilizer prices at more than one place prior to making a purchase. In addition, 50 per cent of the farmers stated they considered cost of fertilizers in deciding on amount and kind of fertilizer to buy. When questioned as to what cost was considered, sixty-four per cent replied cost per ton (Table 13). About one-fourth of the farmers considered the cost per pound of plant food. A very few farmers considered the cost of fertilizer relative to returns expected from its use.

Further evidence of farmers' knowledge of basic economics of fertilizers and their use was brought out in this question: "If the price received for the crop increased and fertilizer prices remained about the same, would you (a) use more, (b) use less, or (c) make no change in the amount of fertilizer used per acre?

Forty-six per cent of the farmers stated they would use more fertilizer per acre, 2 per cent said they would use less, and 50 per cent said they would make no change (not reported for 2 per cent). The answers to this and several other questions indicate the relative importance of tradition and habit in making decisions regarding fertilizer purchases and use.

Sources of Fertilizer Information

Farmers included in the study were asked to name the source of information from which they obtained information about new fertilizers. Twenty-eight per cent mentioned the fertilizer dealer. The next two most frequently named sources of information on new fertilizers were the land-grant college and neighbors

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as indicated below:

Source of information	Percentage of farmers reporting following sources of information about new fertilizers
Dealer	28
Land-grant college	19
Neighbor	14
Own judgment	9
Magazines	8
Radio	6
Television	2
Newspaper	1

In response to the question of where farmers obtained information on fertilizer and its use, which obviously included fertilizer practices, 30 per cent indicated that they relied on their own judgment. Another 30 per cent mentioned the land-grant college. Only 13 per cent of the farmers gave "fertilizer dealer" as the answer.

The fact that dealers were mentioned most frequently as a source of information on new fertilizers gives some evidence of the relative importance of the role that dealers play or can play in farmer education and acceptance of new fertilizers.

Acceptance of High Analysis Fertilizers

Eighty out of 463 farmers or 17 per cent had used a high analysis* mixed grade of fertilizer. The grades reported used, number of farmers and percentage of all farmers who had used these grades of fertilizers were as follows:

Grade of fertilizer	Number of farmers	Percentage of all farmers
0-10-20	28	6.0
0-12-20	45	9.7
0-20-20	22	4.7
8-20-14	2	.4
10-10-10	7	1.5
12-12-12	2	.4
13-13-13	5	1.1
14-14-14	7	1.5
15-15-15	6	1.3

Fifty out of eighty farmers who had used high analysis fertilizer said they preferred it over regular grades. Reasons given for their preference were as follows:

Reason for preference	% of farmers who preferred high analysis fertilizer
More plant food per bag	46
Cheaper per pound of plant food	14
Depends on the crop	14
Other reasons	26

The idea expressed in the reason, "depends on the crop," was generally that high analysis fertilizer was preferred for hay and pasture crops but not for field crops. Farmers reported difficulties in obtaining stands of field crops which they associated with the use of high analysis fertilizers.

(Continued on next page)

* High analysis mixed grade of fertilizer was defined as one containing 30 pounds or more of plant food per 100 pounds of material.

Appendix Table A. Relationship of Various Factors to Tenure, Fertilizer Study

Item	Tenure				All farmers
	Full owners	Part owners	Share tenants	Cash and standing tenants	
Number of farms	196	124	71	71	462[1]
% of all farms	42	27	16	15	100
Average size of farm (acres operated)	216	312	84	94	202
Average age of operator (years)	54	48	47	50	51
% of operators with 7 years or more formal education	70	72	42	32	61
Average net worth (dollars)	21,162	23,553	2,458	1,088	16,041
% who had ever had soil tested	32	36	27	13	30
% who used credit for fertilizer purchases in 1957	39	57	64	96	57
Average pounds purchased per farm in 1957:					
N	1,543	3,599	1,747	848	1,990
P_2O_5	1,845	4,204	1,654	954	2,306
K_2O	1,583	3,921	1,509	1,022	2,111

[1] One farmer of the 463 was classified as a hired manager.

Appendix Table B. Relationship of Various Factors to Age of Farm Operators, Fertilizer Study

Item	Age of farm operator					All farms
	Less than 40	40 to 49	50 to 59	60 to 69	70 and over	
Number of farms	75	148	129	76	35	463
% of all farms	16	32	28	16	8	100
Average age	32	45	54	64	74	51
Average size (total acres)	222	197	174	211	330	202
% of operators with 7 years or more formal education	72	63	64	42	54	61
Average net worth (dollars)	14,680	15,557	14,494	12,457	22,826	16,041
% who had ever had soil tested	32	32	27	27	31	30
% who used credit for fertilizer purchases in 1957	27	62	54	36	22	57
Percentage tenants	43	30	36	23	14	31
Average pounds purchased per farm 1957:						
N	1,693	1,872	2,746	1,465	1,331	1,990
P_2O_5	2,425	2,150	3,208	1,555	1,685	2,306
K_2O	2,157	1,893	3,110	1,338	1,623	2,111

Appendix Table C. Relationship of Various Factors to Level of Formal Education of Farm Operator

Item	Years of formal education				All farms
	None	1-6	7-12	Over 12	
Number of farms	33	149	261	19	462[1]
% of all farms	7	32	57	4	100
Average size (total acres)	86	105	249	645	202
Average age of operator (years)	60	52	49	50	51
Average net worth (dollars)	3,352	7,928	18,175	51,747	16,041
% who had ever had soil tested	15	22	34	53	30
% who used credit for fertilizer purchases in 1957	79	33	50	26	57
Percentage tenants	60	46	25	0	31
Average pounds purchased per farm in 1957:					
N	850	1,629	2,293	3,727	1,990
P_2O_5	1,059	1,805	2,657	4,216	2,306
K_2O	919	1,644	2,435	4,003	2,111

[1] Years of formal education not reported for one farm operator.

Appendix Table D. Relationship of Various Factors to Size of Farm, Fertilizer Study

Item	Total acres operated					All farms
	Less than 50	50 to 99	100 to 149	150 to 299	300 and over	
Number of farms	121	132	74	70	64	461[1]
% of all farms	26	29	16	15	14	100
Average size (total acres)	30	74	123	200	927	202
Average age of operator (years)	51	50	51	52	51	51
% of operators with 7 years or more formal education	41	63	51	79	83	61
Average net worth (dollars)	3,777	8,315	9,747	16,427	56,050	16,041
% who had ever had soil tested	14	29	30	34	55	30
% who used credit for fertilizer purchases in 1957	67	54	58	44	53	57
Percentage tenants	57	26	24	24	8	31
Average pounds purchased per farm in 1957:						
N	659	1,274	1,513	2,672	6,272	1,990
P_2O_5	610	1,187	1,616	2,769	8,462	2,306
K_2O	508	1,015	1,437	2,687	7,858	2,111

[1] Total acres operated not reported for two farms.

Preferences as to Source of Nitrogen

Forty per cent of the farmers in the study said they preferred ammonium nitrate as a source of nitrogen while 36 per cent preferred nitrate of soda. Reasons for the preference of each source of nitrogen are reported in Table 14. Again the importance of habitual or traditional behavior presents itself. The major reason for preference of nitrate of soda was "always used this source.'

Summary

Alabama farmers are, in general, doing a better job of fertilizing cotton than corn or hay and pasture crops. Tenure of farm operators plays an important role in the amount of fertilizer used per acre on cotton and corn. Size of farm, years of formal education, and age of the farm operator are also related to level of fertilizer use. It is recognized that the so-called independent factors are interrelated.

A larger portion of tenants than owners or part owners used credit for fertilizer purchases. Commercial banks, fertilizer dealers, and landlords play a vital part in extending credit and in influencing farmers in their use and acceptance of fertilizers. Habitual behavior or tradition appears to be of great significance in connection with fertilizer decisions by Alabama farmers. Therefore, banks, dealers, landlords and educational workers face a great challenge in helping farmers to make greater profits from wise use of fertilizers.

RESEARCH RESULTS AND REPORTS

Gibberellic acid, according to tests at California's Riverside AES, prolongs storage life of lemons. They color more slowly and keep in storage longer. But there are still problems to lick . . . some not-so-desirable effects.

* * *

Crown Zellerbach has been test-plotting at their tree farm in Cathlamet, Wash. and find they have a pellet fertilizer which gives them three years growth in two. This is a "Lifesaver" looking pellet, and about the size of the well known candy mint. Dropped in the hole as the seedling goes in, it releases urea and superphosphate so slowly that the effect lasts as long as 3 years. Cost of fertilizing the seedlings is less than $10 per acre and the rate of survival adds to the economy of the operation. Ray Austin, their forest research head, developed the pellet, and the company has applied for a patent.

* * *

Colorado State has begun a 4-year project on the effect of phosphates on alfalfa, with William T. Franklin in charge.

* * *

Moisture level seems to be the answer when potash does well one year, and not so well the next. So reports Dr. J. B. Peterson, Purdue agronomy head, working on a $7500 grant by the America Potash Institute. The project is being conducted by Prof. Stanley A. Barber.

* * *

Dry-land wheat has been the subject of research by the University of Idaho, who are studying the effect of nitrogen fertilizers at the Tetonia and Aberdeen branch stations. Rate of application, time of application, comparison of various fertilizers and application to winter and spring wheat. Results show that different kinds of N fertilizers work equally well, N rates being equal. Response has been better on winter than on spring wheat, says G. Orien Baker.

* * *

Canadian forests need fertilizer, says G. R. Snyder of Canadian Industries Limited. He decries the old belief that the humus which constitutes the top layer of forest soil is so rich that no fertilizer is needed. This is a myth . . . laboratory tests show that many forest soils are deficient in N, and to a lesser degree in P, K and a number of minor elements.

* * *

Tobacco responds as well to synthetic organic and inorganic sources of nitrogen as to the traditional meal, when used in accordance with their peculiar properties, reports Dr. Henry C. DeRoo of the Connecticut AES. And the modern N sources are cheaper. They have a bulletin, #623, on the results to date.

Fire Ant Needs Less Spray

Recent findings at the Southern Plant Pest Control Region Laboratory in Gulfport indicate that approximately half the amount of insecticides will be needed in the eradication of the imported fire ant than was originally planned. This will result in a saving of $900,000 this year and $1 million next year.

The Gulfport laboratory's activities cover an 11-state area—Oklahoma, Texas, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Florida, Georgia, North Carolina and South Carolina.

Will Isotopes Banish Pesticides?

At a recent conference on Radioisotopes in Agriculture, Atomic Energy Commissioner John F. Floberg is quoted as predicting that in a few years radioisotopes can make insecticides as obsolete "as we hope war has become." He cited the success of the screw-worm fly in Florida as an example of this.

Plant Food from Corn and Old Shoes

Ersatz is running rampant in the East. Over our desk, on the same day, flowed two items: 1. Maine Reduction Co., Bangor, is making a high protein fertilizer from old shoeleather. 2. From New York a note about the use of the heart-rings of hybrid corn-cobs as a mulch. When wet, this expands several times its dry volume, creating a breathing action, they tell us.

Only Half Enough Farmer Graduates

Of the 15,000 new jobs in agriculture available each year, the schools are turning out only half enough graduates to fill them, says Assistant to the Secretary of Agriculture, Lewis B. Rock, Jr.

Geiger Counts Pollution

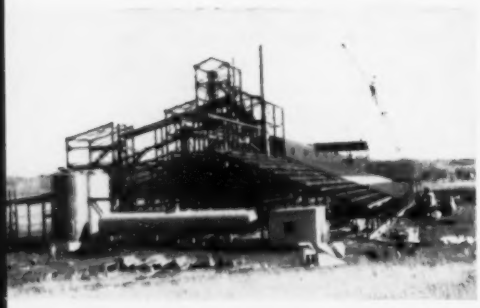
The Geiger Counter, well known as a radiation detector, is now being used to measure traces of many specific gases and vapors in air and streams.

Grass to Granules

in Half a Year

"Grass"—July 17

September



November

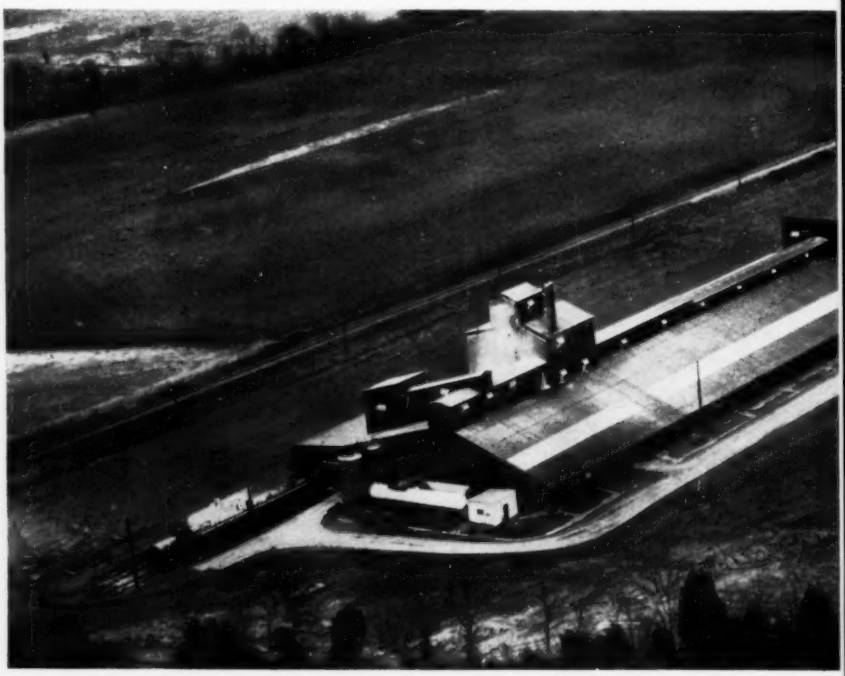
January

In constructing the big and completely modern granular manufacturing operation for Cooperative Fertilizer Service at Russellville, Kentucky, the 62 year old A. J. Sackett and Sons Company of Baltimore, Maryland turned in a truly remarkable performance record. The rapid construction pace is graphically illustrated by the accompanying progress views.

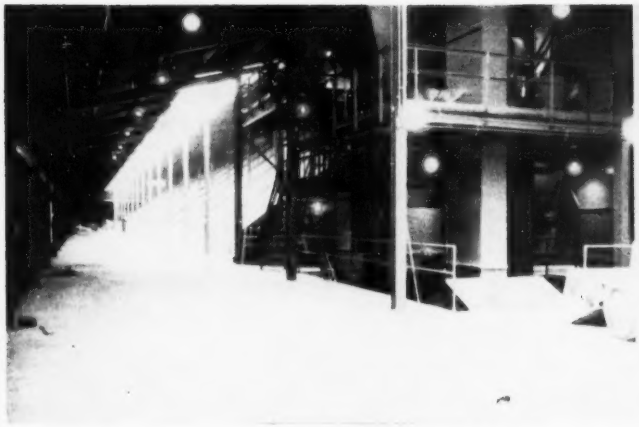
This new facility was built on a 250 acre rolling meadow in the south-western part of the State just east of Russellville. While the site was in grass when construction work first got under way on July 17th last, the faster-than-normal rate of progress, which was consistently maintained, permitted this new plant to go "on stream" February 4th . . . "grass to granules in half a year," is the way one of the plant's earliest visitors so aptly expressed it.

In addition to the plant proper, the turnkey contract awarded Sackett included the double railroad sidings to serve the plant and the receiving and storage facilities for all liquids including phosphoric acid, sulphuric acid, ammoniating solutions and anhydrous ammonia. Also included were the office, maintenance and service buildings, as well as a nitrate storage building separated from the main plant by an extended concrete causeway.

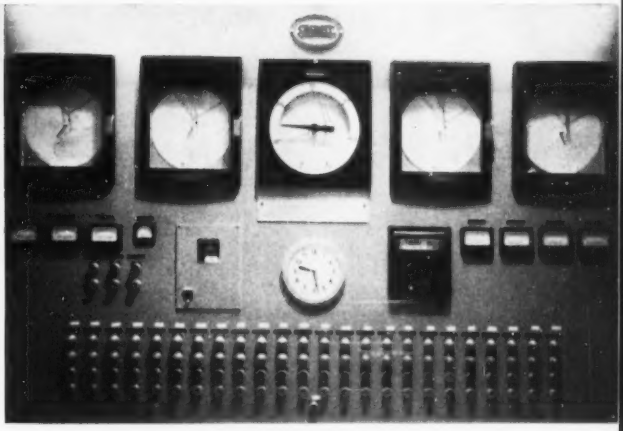
The plant itself is 450 feet long by 120 feet wide including a 30 foot enclosed canopy for truck shipments at one end. Thirty bins are provided in the building for bulk storage of raw materials and granular mixed goods. Means are provided for receiving and storing solid raw materials from hopper cars, box cars or dump trucks. Or, if desired, these materials may be transferred directly to the compounding hoppers of the granulating process. Separate shuttle belt conveying systems are provided for transferring raw materials and finished granulated end products to storage.



"Granules"—February 4. On this date plant made its first granular product



General Interior View of Plant



View of Central Control Panel

The compounding and mixing equipment not only does a pushbutton job of weighing and blending the solid ingredients for delivery to the granulating process, but it also provides management with a printed record showing the exact weight of each ingredient weighed through the process.

After being accurately weighed through the compounding system, the solid ingredients are thoroughly blended by the Sackett Gravity Mixer, thence, to a self-compensating type continuous weighing machine. This machine supplies an accurately controlled flow of the blended solid ingredients to the ammoniating section of a combination TVA Ammoniator-Sackett STAR* Granulator, wherein the introduction and mixing of metered flows of the liquid required by the formula takes place.

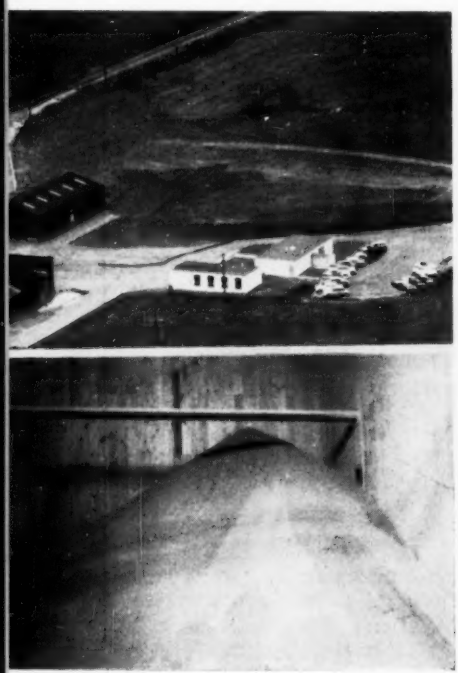
Upon completion of the ammoniation phase, the moist mass then enters the STAR* Granulator section where it undergoes a vigorous rolling into firm granules or pellets. From the STAR* Granulator the material is fed to a gas-fired direct heat co-current rotary dryer, which is provided with a refractory lined combustion chamber of the Sackett Tuyere Design, and with modulating controls and flame safety equipment.

The dried material is then fed to a counter-current rotary cooler, thence, to the final product classifying equipment, which is provided with a six port manifold exhaust system. Means are provided for taking the finished granular products to bulk storage bins or direct to either of two shipping units. Powdered mixed grades may also be produced by this same equipment at a somewhat higher rate of production.

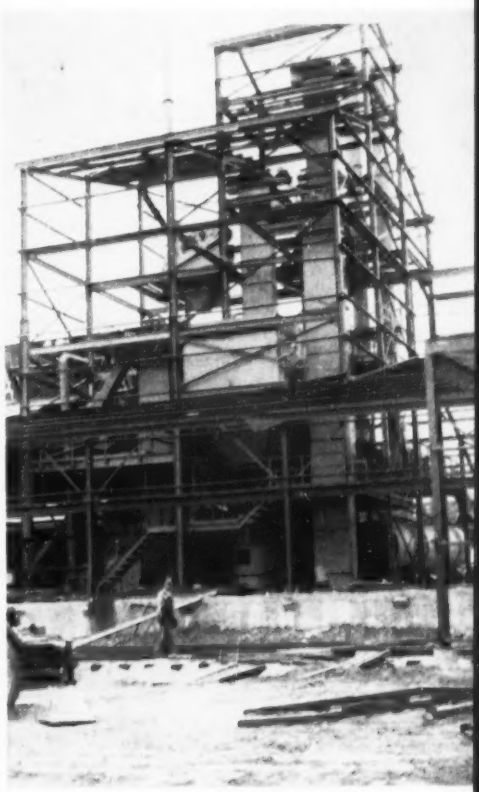
In this plant the products are packaged in 50 lb. and 80 lb. bags on independently operated shipping units using the latest type open mouth packers and high speed sewing units. Movement of the bags from the sewing units right onto the bed of the trucks is fully mechanized. Railroad cars may also be loaded for shipment with a minimum of labor.

One of the two shipping units was designed for the incorporation of insecticides into the fertilizers at time of shipment. This same unit is also provided with means for shipping fertilizers in bulk. For this purpose, a 50 ton capacity 10 foot by 50 foot platform scale was installed at the loading point, which unit is also used to check-weigh incoming liquids by tank truck and outgoing truckloads of packaged products.

An attractive office of modern design houses the accounting personnel and provides private offices for the plant manager and production superintendent. The service building is equipped with complete facilities

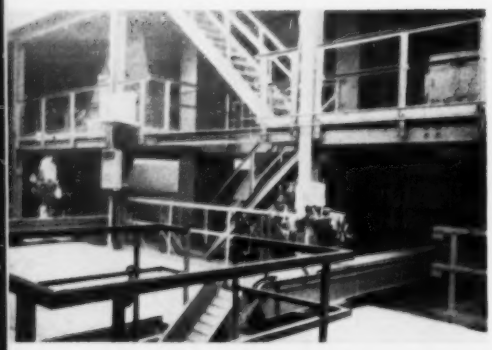


as shown on inset.



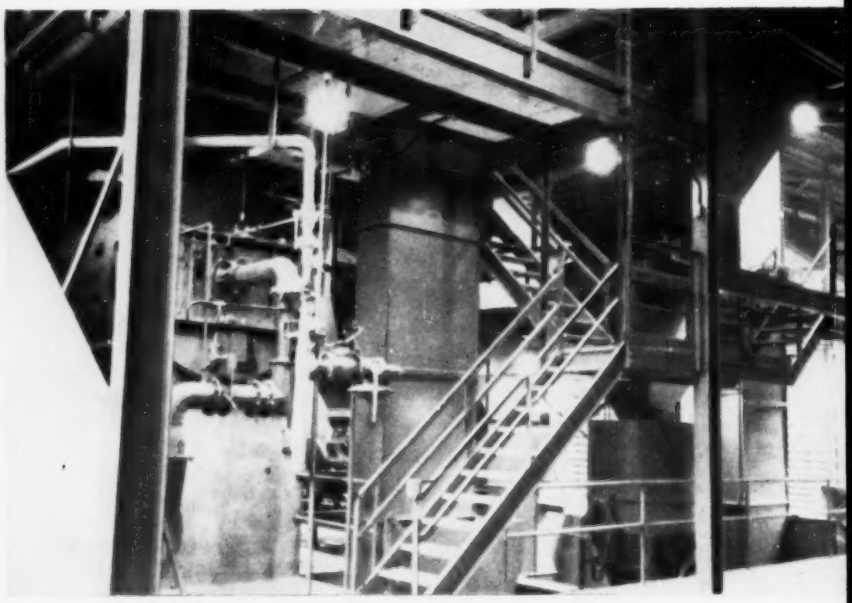
Construction View of Manufacturing Equipment Area

* U. S. and Foreign Patents Pending



Interior View of Packaging Area

Interior View of General Office Area



View of Dryer Combustion Equipment, Compounding System and Sackett Gravity Mixer

for the factory personnel. A separate garage provides ample area for the storage and maintenance of mobile equipment. This building also houses the spare parts room and chemical laboratory.

A. M. Morris, a man of proved ability, has been selected to direct the operation of the new plant.

— GRANTS —

$780,000

American Cyanamid Co. has announced grants-in-aid to scholars and colleges totaling $780,000 in 1959-'60. In that year, 140 colleges will receive assistance through scholarships, fellowships and gifts, bringing the company's total gifts over the last six years to more than $4,000,000.

$20,000

The Rockefeller Foundation has made a $20,000 one-year grant to the University of Minnesota for research in the department of agronomy and plant genetics and the department of plant pathology and botany.

The research will be concerned with genetics of wheat and with genetics of the stem rust organism. The work will be directed by Leon Snyder, geneticist, and J. J. Christensen, head of the plant pathology and botany department.

This will be the seventh year of Rockefeller Foundation support for this type of research at the University.

$2,500

A study to determine who makes the decisions about using fertilizers on California farms is now underway at the University of California Davis Campus, made possible by a grant of $2,500 from the National Plant Food Institute, it was announced by Dr. Richard B. Bahme, Western regional director of the Institute. The study is being conducted by two University research workers, Luverne Donker and Douglas Kleist, under the direction of Dr. Orville Thompson of the University's Department of Education.

$2,500

Another National Plant Food Institute sponsored study of the economic benefits of fertilizing certain important California crops should turn up some valuable information to be made available to farmers and others within the next year, according to Dr. Bahme.

The $2,500 grant-in-aid is being put to work at Davis under the supervision of Dr. Chester McCorkle, Associate Professor of Agricultural Economics. Drs. Gerald Dean and Harold Carter, instructors in the Department, are now busy digging out useful research on crop fertilization which they will analyze with the assistance of Gordon Fisher, senior student in agricultural economics.

CFA Moves Office To Sacramento

On June 1, 1959, the office of the California Fertilizer Association moved from San Marino to Sacramento, as requested by the Board of Directors.

It was felt that the staff could better serve the industry from Sacramento, which is the headquarters of the Bureau of Chemistry and of Weights and Measures, and is a short twenty miles from the principle campus of the University College of Agriculture at Davis.

As of June 1, CFA's new address is: California Fertilizer Association, Room 213, Ochsner Building, 719 "K" Street, Sacramento, California; Telephone: HIckory 4-7625.

Grows Self to Death

All those who struggle to nurture clean, pure lawns will be fascinated to know that when you apply gibberellic acid to nutgrass, the darn stuff grows itself to death. So says the Georgia AES.

Phillips *66* Technical Service Men give on-the-job assistance to help solve fertilizer production problems

NEED more effective formulations? What about your ammoniator . . . is it operating efficiently? Do you have a production problem? Then, call in your Phillips *66* Technical Serviceman. He'll be glad to offer you his experience and training—right at your *plant*, for *your* particular problem.

He has behind him all of the Phillips technical know-how, plus the electronic "brains" of Phillips famous Electronic Computer Service—a service that has already saved some fertilizer manufacturers thousands of dollars.

For "inside" information and technical assistance that can mean greater efficiency and increased profits . . . write, wire or call the nearest Phillips sales office.

* * *

Look to Phillips for a dependable source of • Nitrogen Solutions • Anhydrous Ammonia • Ammonium Nitrate • Ammonium Sulfate • Triple Superphosphate

"Good Name Phillips 66 *to Mix With"*

PHILLIPS PETROLEUM COMPANY

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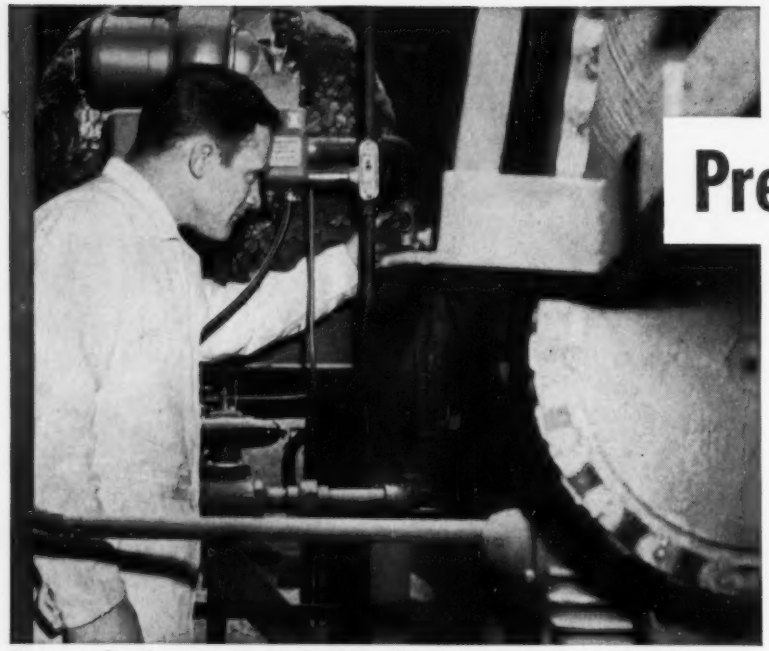
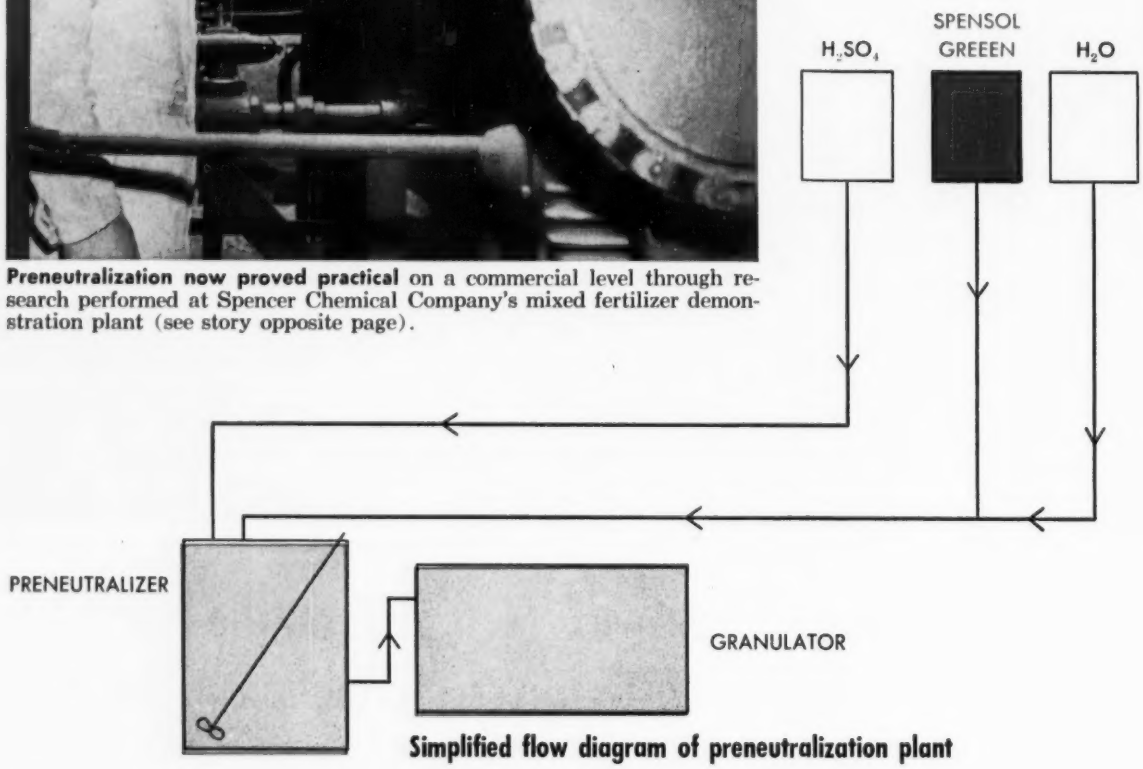
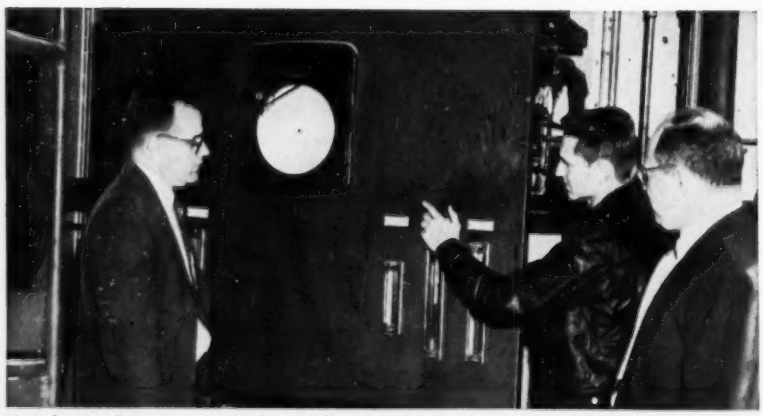
Preneutralization



Preneutralization now proved practical on a commercial level through research performed at Spencer Chemical Company's mixed fertilizer demonstration plant (see story opposite page).



Simplified flow diagram of preneutralization plant



Members of Spencer's Technical Service Team check the results of an experiment. Here, data is being checked for commercial possibilities.

SPENCER®

PROGRESS REPORT

—Key To Cutting Your Production Costs As Much As $5.00 Per Ton:

Spencer Chemical Company now offers a way you can produce up to 20% nitrogen fertilizer without using dry nitrogen:

LIKE to manufacture nonphosphate and inverted grades without dry nitrogen materials? The latest research from Spencer Chemical Company* indicates that you can — just by using a large-scale operation of the preneutralization process.

Proven practical by Spencer in their mixed fertilizer demonstration plant, the process has already been put to work for a number of manufacturers with the help of Spencer's Technical Service Team.

By using preneutralization, these manufacturers can produce a 1-1-1 like a 12-12-12, inverted ratios such as 3-2-2 like a 15-10-10 and a 2-1-1 like a 20-10-10. And here's a sample of the savings you can expect with preneutralization:

Boosts Profit Potential

When producing 20-10-10, you would normally use about 10 units of SPENSOL GREEEN and 10 units of a dry nitrogen, such as ammonium sulfate. With preneutralization, you use 20 units of SPENSOL GREEEN and no ammonium sulfate—a saving in production costs of as much as $5.00 a ton, depending on current raw material costs in your area.

Small Cost, Big Benefits

The cost of installing a preneutralization operation is small, Spencer reports. Extra equipment needed will amount to $4,000 to $6,000, according to Spencer's Technical Service Department.

Because Spencer has pioneered in the development of this new type of operation, manufacturers are seeking the company's advice on planning, installation and operation of preneutralization. Already, the Spencer Technical Service team has helped several companies through all stages from preliminary planning to final on-stream operation.

A Spencer man can provide this know-how, based on his own commercial experience, if preneutralization equipment is needed in your mixed fertilizer plant.

More News Ahead From Spencer's Demonstation Plant

As these and other problems are solved by Spencer Chemical Company's Technical Service Department, complete reports will be made available to the fertilizer industry.

If you would like additional information on preneutralization, write Technical Service Department, Spencer Chemical Company, Dwight Bldg., Kansas City 5, Mo.

*While Spencer Chemical Company does not make or sell mixed fertilizer, it is constantly working to help find ways of producing higher-analysis mixed fertilizer with low-cost materials.

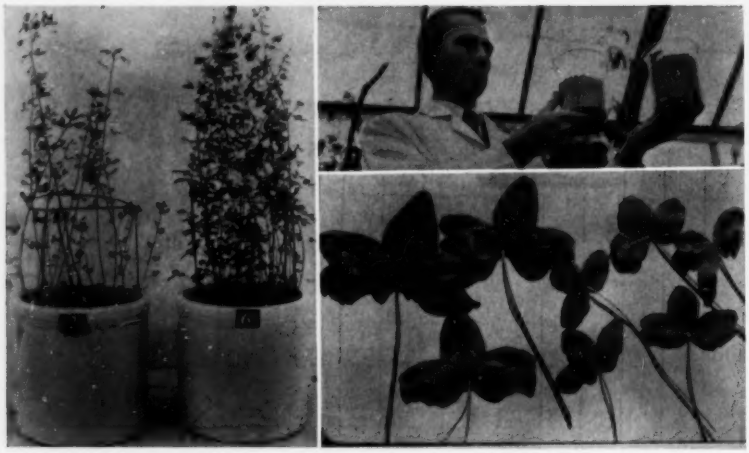
America's Growing Name in Chemicals

SPENCER CHEMICAL CO., Dwight Bldg., Kansas City 5, Mo.; District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Kansas City, Mo.; Works: Pittsburg, Kans.; Chicago, Ill.; Henderson, Ky.; Vicksburg, Miss.; Orange, Texas.

Insist on SPENSOL GREEEN (Spensol Nitrogen Solutions)

SPENCER®

Little Soil Giants Help Upgrade Fertilizer



Left: Alfalfa treated with molybdenum (right) exhibits far greater growth and health than the untreated plants in pot No. 2.
Top right: A big boost in the yield of peas is possible through treatment with the nutrient molybdenum. The amazing increase possible is illustrated here. Peas in each beaker were picked from test plots of the same size—but the molybdenum treated peas on the right far outnumber those (untreated) on the left.
Below: Clover too can benefit from the addition of fertilizers containing the trace element molybdenum. The difference between moly treated clover (left) and clover suffering from moly starvation can readily be seen.

Many fertilizer producers today are taking a closer look at trace elements as possible components for their prdoucts. The reason? These little soil giants provide a means of upgrading fertilizer—hence make it possible to command higher prices and reap greater profits.

There are seven trace elements generally recognized by agronomists as essential to crops: iron, manganese, boron, zinc, copper, molybdenum and chlorine. Still others are believed necessary to plant development, but sufficient data has not yet been compiled.

Among these elements there has been much recent interest shown by farmers in molybdenum. This Spring hundreds of farmers have turned to 'moly' for the first time as a possible means of boosting crop yield. Much of the growing trend can be attributed to past success with this element in Washington, Oregon and New Jersey in particular. Equally important is a convenient new development by which seed can be treated with molybdenum before planting.

Seed treatment appears to be ideal for annuals, but is of course out of the question for established perennials. It is here that special molybdenum-containing fertilizers have their greatest potential and, in fact, are apparently much in need. Paradoxically the evolvement of molybdenum seed treatment will most likely open the door to increased demand for molybdenum fertilizers. Farmers who seed treat their annuals with the element and become convinced of its value will, no doubt, be in the market for a fertilizer containing molybdenum for use on their perennials.

Molybdenum was established as essential to plants back in 1939 when University of California scientists found in experiments that plants would not grow without it. But at the time it was believed that soils had enough natural molybdenum and thus the findings were shelved. Later, in Australian studies on soils where clover could not be successfully grown, scientists noticed that clover flourished in areas where trees had previously been cut down and burned. Analysis showed that the wood ash contained molybdenum—hence came the realization that additional supplies of the element could be helpful.

The principal functions of molybdenum are to enable plants to fix and to utilize nitrogen. Highly acid soils appear to have a greater general need for additional molybdenum. As for crops, legumes have proved to be the most responsive to treatment—peas, clover, alfalfa, soybeans and peanuts in particular. Certain truck crops, such as broccoli and cauliflower, have also enjoyed unusually good results.

Originally it was believed that treatment with molybdenum was useful only on highly deficient crops and soils. Since then it has been found that although the most dramatic results are produced under these conditions, apparently healthy crops grown on seemingly rich soils may also respond to additions of molybdenum. This makes its inclusion in fertilizer more practical now.

Like all of the trace elements, only small quantities of molybdenum are needed per acre. The needs of soils vary, of course, but the unusual treatment in the U.S. is eight ounces per acre.

Up until now sodium molybdate has been the principal form of molybdenum used in fertilizers. Just recently, however, Climax Molybdenum Company has developed 'Moly-Gro®' Fertilizer Additive which is designed to provide substantial savings as well as improved performance. The new material contains a minimum of 42% molybdenum as compared to only 38.5% in sodium molybdate. Thus, about 9/10ths of a pound will do the same job as a full pound of sodium molybdate.

Trace elements in fertilizers — molybdenum, for example—appear to have a future. But as to the extent it's rather early to speculate. One thing certain is that they offer good merchandising opportunities.

Here is an area where fertilizer producers can stress added benefits from their special, super-quality products—benefits which can mean substantially higher profits for farmers . . . and for merchandising-minded mixers.

New LSU Building

According to Dr. Daniel Borth, dean of administration, a two level, $648,870 feed and fertilizer building will be erected on the Louisiana State University campus at Baton Rouge, La.

The new facilities will enable LSU to make tests for nitrogen and organic matter for the first time. Plans call for completion by the fall of 1960.

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ACCIDENTS like this *will* happen. That's why International Paper plans for extraordinary stresses and strains when designing its Bagpak multiwall bags.

Only genuine *Gator Hide*® kraft, famous for toughness, is ever used in making Bagpak multiwalls. Quality is controlled every step of the way. International Paper can do this because it grows its own trees, makes its own paper, converts it into printed multiwall bags to your order. It also designs and builds *Bagpaker*® machines that can package up to 60 tons of material per hour!

When you buy Bagpak multiwall bags you get speedy shipments geared to your production schedules. *Twenty-one* sales offices and four strategically-located plants save you money by keeping your inventory at a minimum.

Only Bagpak multiwalls are backed by the full resources of International Paper—world's foremost pulp, paper and paperboard producer.

Next time your Bagpak field service engineer drops by, ask him what's new. He knows.

Bagpak Division **INTERNATIONAL PAPER** New York 17, N.Y.

YOU MAY WISH TO SAVE THIS TABLE FOR REFERENCE

United States Fertilizer Consumption, by State and Region, year ended June 30

(1,000 tons)

	1944-45	1945-46	1946-47	1947-48	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58 (Prel.)
Maine	235	254	253	257	230	225	165	213	211	172	182	183	172	182
New Hampshire	29	28	23	33	26	28	26	21	21	16	18	16	19	20
Vermont	38	47	46	57	65	63	63	56	50	38	48	51	55	59
Massachusetts	89	89	84	86	92	89	96	92	85	85	85	74	87	87
Rhode Island	18	18	17	19	19	18	18	17	16	15	17	15	17	18
Connecticut	86	85	83	83	89	94	89	87	88	90	88	77	84	89
New England	**493**	**521**	**506**	**535**	**521**	**517**	**457**	**486**	**471**	**417**	**440**	**416**	**435**	**455**
New York	532	547	575	579	587	609	627	635	660	609	630	574	578	603
New Jersey	249	247	245	254	276	238	258	265	277	291	286	262	269	246
Pennsylvania	498	516	551	565	586	632	625	665	697	681	715	653	634	640
Delaware	49	52	55	54	57	58	67	80	91	95	96	85	88	78
Dist. of Columbia	1	1	2	2	2	2	2	3	3	3	3	3	3	4
Maryland	225	229	255	244	246	252	276	297	304	313	318	281	292	283
West Virginia	67	90	95	100	102	104	101	100	87	77	82	85	82	73
Middle Atlantic	**1,622**	**1,681**	**1,777**	**1,797**	**1,856**	**1,894**	**1,956**	**2,044**	**2,119**	**2,069**	**2,129**	**1,943**	**1,946**	**1,927**
Virginia	599	653	676	698	709	728	831	869	853	799	817	778	772	708
North Carolina	1,475	1,572	1,784	1,642	1,815	1,740	1,899	1,941	1,902	1,849	1,829	1,701	1,567	1,464
South Carolina	780	806	864	901	996	875	959	979	976	941	929	864	818	733
Georgia	1,003	1,098	1,267	1,280	1,278	1,188	1,312	1,301	1,386	1,369	1,276	1,271	1,293	1,248
Florida	795	885	882	724	738	878	1,002	1,090	1,155	1,185	1,229	1,339	1,477	1,461
South Atlantic	**4,653**	**5,014**	**5,474**	**5,245**	**5,536**	**5,409**	**6,004**	**6,180**	**6,271**	**6,143**	**6,081**	**5,953**	**5,928**	**5,614**
Ohio	640	692	780	853	931	907	952	1,050	1,174	1,094	1,085	1,050	1,036	1,053
Indiana	500	605	663	803	827	798	935	1,083	1,206	1,181	1,153	1,064	1,087	1,081
Illinois	487	554	967	1,007	973	871	1,177	1,434	1,653	1,506	1,211	1,360	1,369	1,422
Michigan	311	374	399	411	466	474	506	591	648	600	639	628	637	615
Wisconsin	238	290	349	425	398	384	410	394	419	441	430	412	426	436
East North Central	**2,176**	**2,516**	**3,159**	**3,500**	**3,595**	**3,434**	**3,979**	**4,552**	**5,101**	**4,823**	**4,517**	**4,515**	**4,555**	**4,607**
Minnesota	95	167	153	226	252	218	201	225	268	323	373	368	426	445
Iowa	143	196	229	309	368	333	386	427	550	652	585	449	468	534
Missouri	167	215	278	325	389	408	637	753	834	757	683	810	802	756
North Dakota	7	8	18	34	22	19	14	31	40	48	63	69	82	106
South Dakota	1	2	5	11	10	5	9	11	17	30	38	27	25	34
Nebraska	3	8	12	25	38	44	68	94	146	199	208	133	170	232
Kansas	47	40	74	98	113	160	186	208	240	216	235	208	212	191
West North Central	**462**	**636**	**770**	**1,028**	**1,191**	**1,186**	**1,501**	**1,750**	**2,095**	**2,224**	**2,184**	**2,064**	**2,185**	**2,298**
Kentucky	317	372	386	476	551	554	560	630	614	582	523	535	542	523
Tennessee	342	412	418	500	499	506	548	603	580	524	532	516	545	492
Alabama	813	852	919	1,094	1,186	1,140	1,305	1,343	1,258	1,183	1,160	1,099	1,039	962
Mississippi	497	577	542	705	706	641	793	826	737	735	722	750	747	628
East South Central	**1,969**	**2,213**	**2,265**	**2,776**	**2,942**	**2,841**	**3,206**	**3,401**	**3,189**	**3,024**	**2,936**	**2,900**	**2,873**	**2,605**
Arkansas	152	187	218	231	317	319	383	359	366	371	333	363	326	290
Louisiana	211	256	254	262	250	275	325	330	319	318	321	303	289	277
Oklahoma	23	37	57	82	102	141	146	173	147	145	127	136	108	107
Texas	234	310	406	458	480	554	610	615	571	561	586	567	595	667
West South Central	**620**	**789**	**935**	**1,033**	**1,148**	**1,288**	**1,464**	**1,477**	**1,402**	**1,395**	**1,367**	**1,369**	**1,318**	**1,341**
Montana	9	10	12	13	9	11	21	23	26	29	24	33	44	39
Idaho	45	49	58	59	46	52	47	73	74	90	106	64	85	104
Wyoming	4	5	5	8	5	6	6	7	12	11	11	11	10	12
Colorado	17	26	27	33	36	39	51	48	49	48	49	54	59	81
New Mexico	13	10	14	12	14	19	22	19	28	22	33	29	38	39
Arizona	35	32	61	79	62	62	104	117	132	155	172	154	178	204
Utah	13	11	19	18	11	16	29	31	32	28	28	31	32	32
Nevada	0	0	1	1	1	1	1	6	11	9	3	4	7	22
Mountain	**136**	**144**	**197**	**222**	**184**	**205**	**281**	**323**	**363**	**393**	**425**	**380**	**454**	**533**
Washington	76	98	104	83	80	81	86	92	124	201	199	170	185	245
Oregon	50	74	98	87	75	97	125	120	148	147	172	170	218	191
California	944	1,018	1,221	1,203	1,072	1,037	1,449	1,627	1,752	1,526	1,834	1,914	2,128	2,173
Pacific	**1,070**	**1,190**	**1,423**	**1,372**	**1,228**	**1,215**	**1,659**	**1,839**	**2,024**	**1,875**	**2,205**	**2,253**	**2,531**	**2,609**
Continental U. S.	**13,201**	**14,704**	**16,507**	**17,508**	**18,201**	**17,989**	**20,508**	**22,052**	**23,035**	**22,362**	**22,284**	**21,794**	**22,224**	**21,989**
Hawaii	91	111	89	99	106	115	126	116	129	140	157	166	194	136
Puerto Rico	174	212	242	248	234	250	354	264	247	271	283	233	290	233
Alaska	---	0	0	1	---	---	1	1	1	---	---	---	---	---
Territories	**265**	**324**	**332**	**348**	**341**	**366**	**481**	**380**	**377**	**411**	**440**	**399**	**485**	**369**
TOTAL	**13,466**	**15,028**	**16,839**	**17,856**	**18,542**	**18,355**	**20,989**	**22,432**	**23,413**	**22,773**	**22,724**	**22,193**	**22,709**	**22,358**

Prepared by National Plant Food Institute
Source: Agricultural Research Service, U. S. Department of Agriculture

INTERNATIONAL'S
FULL ORBIT
SERVICE

Setting New Standards of Customer Service

Your IMC triple super salesmen

bring you

the **BEST**

in **PRODUCT**

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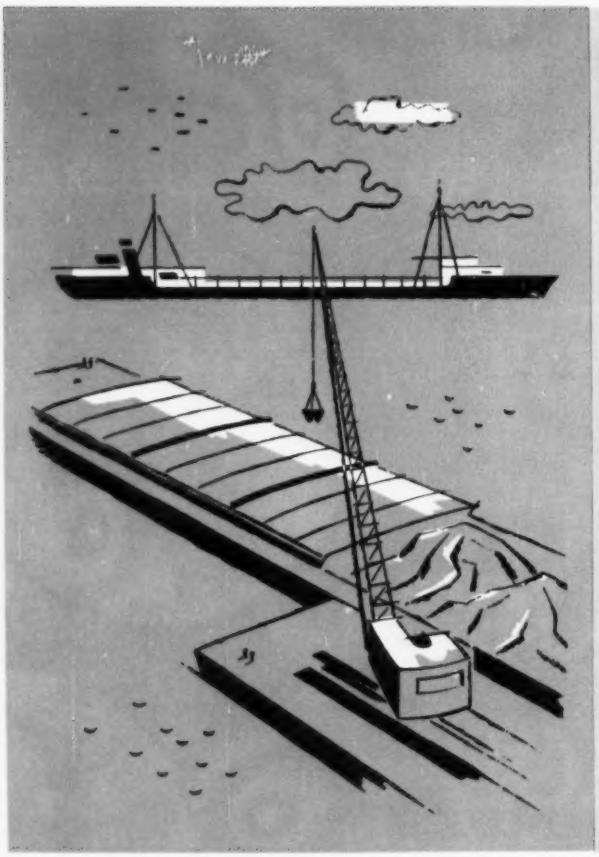
Only from International...

triple superphosphate with



IMC transportation service masters the maze of shipping problems for you

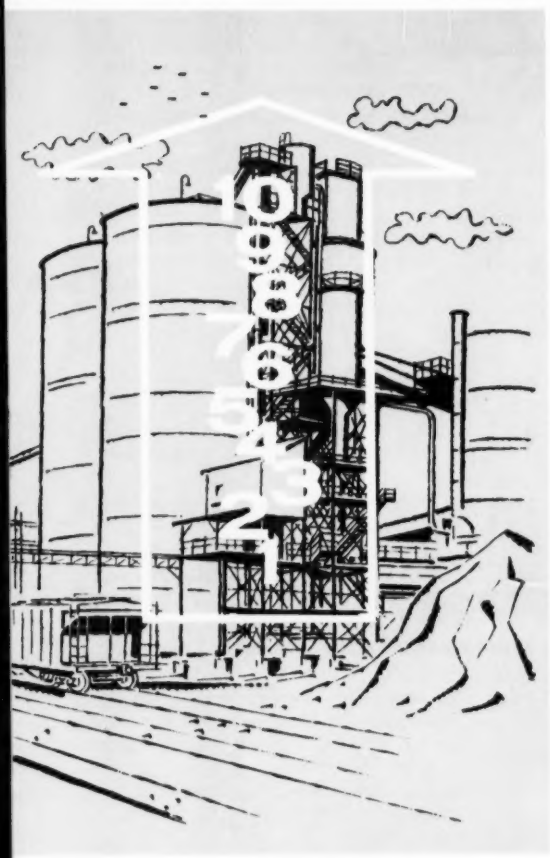
Let's face it: delivery can give you skull-busting headaches . . . unless you're protected by International Minerals' General Transportation Service. IMC helps you choose lowest cost methods — ship, barge, rail. IMC offers other advantages, like on-site storage at key transportation centers and rolling warehouse shipments. We can help you with rate negotiations, routing or interpretations of shipping regulations. In short, International Minerals takes the trouble out of triple super shipping.

Triple super trouble shooters -- complete and personalized technical service at your plant

Technical trouble-shooting in the fertilizer business takes experience and personnel. And International Minerals has both — a staff of technicians that stands ready when you need them . . . to help cut your in-plant production problems down to size. Let us help you in formulation . . . choosing equipment . . . designing plant layouts . . . streamlining materials handling . . . or in applying research information. Call on IMC for complete trouble-shooting service that works for you *at no cost to you!*

INTERNATIONAL'S
FULL ORBIT
SERVICE

triple-value service



FULL ORBIT SERVICE . . . IDEAS AND PLANS TO BUILD VOLUME, PRODUCE MORE PROFIT OVER COSTS!

International Minerals' Full Orbit Service is helping fertilizer manufacturers chart new profit strategy.

It's an exciting and *proved* program that sets new standards of service in the industry. First benefit is IMC's extremely high quality triple superphosphate. Then comes Full Orbit technical help in ironing out your in-plant problems . . . plus help in a host of ways to eliminate your transportation troubles.

Full Orbit Service makes the most of buyer-supplier teamwork to help you solve marketing problems . . . get the most from your sales manpower . . . make sales meetings pay off . . . and get real results from your promotion dollars through professionally planned use of newspapers, radio and TV.

The best part is, International's Full Orbit Service doesn't cost you a cent. Contact your International representative now. There's no obligation. Find out — as many other fertilizer manufacturers have — how IMC's Triple Superphosphate and Full Orbit Service can help you realize extra profits while you benefit from a smoother working operation.

From mine to manufacturer, International's quality count-down adds up to superior product control

Nobody guards triple super quality as carefully as International Minerals. Over 40 separate tests are used! More than 400 chemical analyses are made daily. IMC absolutely controls triple quality with a countdown that follows the product from raw material to shipment of the finished product. And as a final quality check, every shipment of International Triple Superphosphate has its own certificate of analysis — mailed to you before material arrives at your plant. Depend on IMC for quality.

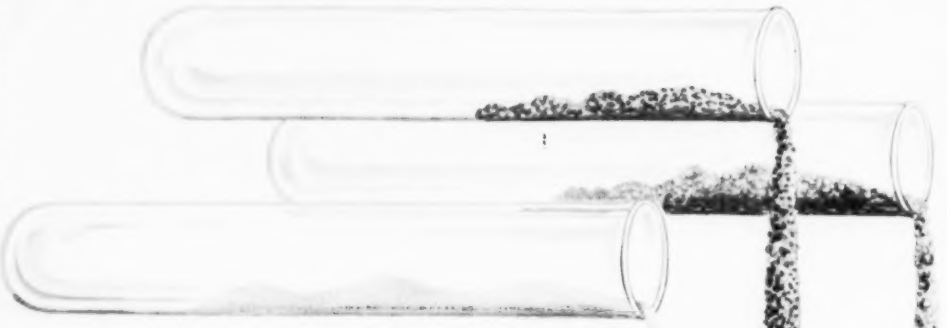
MINERALS
International
CHEMICALS

Producers of Living Minerals

COARSE — International's coarse-textured Triple gives you the same excellent ammoniation batch after batch . . . promotes desirable agglomeration.

GRANULAR—International's granular Triple is non-crumbling, free-flowing, easy to apply—makes this product ideal for direct application.

RUN-OF-PILE—International's even-textured Triple provides uniform particle size, even density and high porosity that lets you ammoniate at higher rates, temperatures.



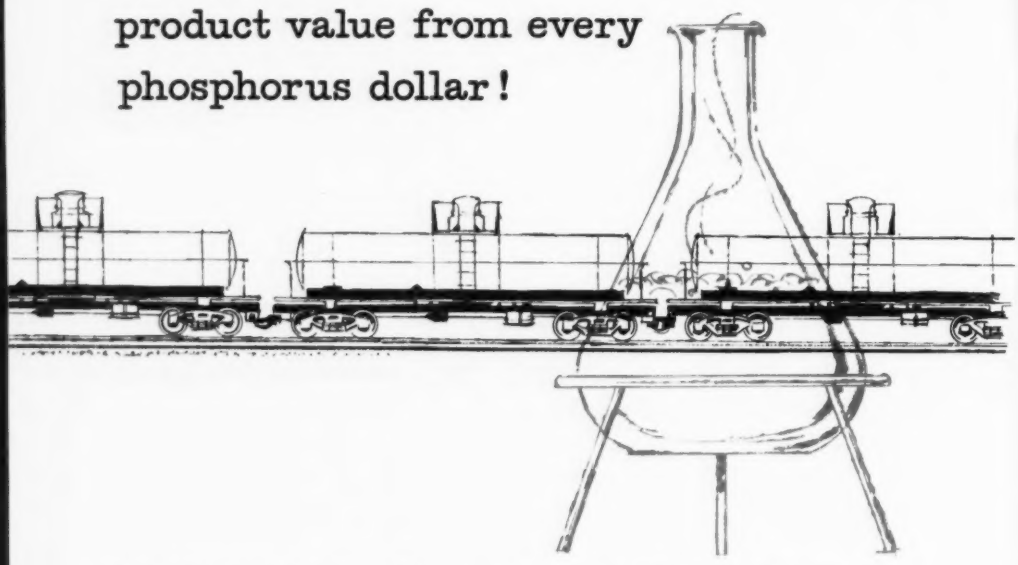
TRIPLE SUPERPHOSPHATE

Available P_2O_5 (min. guarantee) — 46.0%

Particle size:

	R.O.P.	GRANULAR	COARSE
—6 mesh	98-100%	97% min.	97% min.
—65 mesh	22-34%	0.5% max.	4% max.

An International contract helps you get full product value from every phosphorus dollar!



IMC TRIPLE SUPERPHOSPHATES AND PHOSPHATIC FERTILIZER SOLUTION SOLVE FORMULATION PROBLEMS

Now you can make International your dependable single source of all high-analysis phosphate ingredients. Benefit from International's three grades of top-quality triple superphosphate plus high purity 53%-55% phosphatic fertilizer solution. Get all the quality advantages International's processing adds to your product. Be sure with International.

Producers of Living Minerals

MINERALS International CHEMICALS

SPECIAL PRODUCTS DEPT., PHOSPHATE DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Administrative Center: Skokie, Illinois

Meetings & Associations

Alabama Program Covers 20 Counties

The Alabama Soil Fertility Program launched earlier this year by the Alabama Agricultural Extension Service is moving ahead at full steam, according to J. C. Lowery, Extension Agronomist.

Assisting Mr. Lowery with this extensive program are F. E. Boyd and Charlie Summerour, president and secretary respectively of the Alabama Soil Fertility Society. Mr. Boyd and Mr. Summerour have been very active in the initial organizational phases of the undertaking and have actively participated in the various county kick-off meetings that have been held.

The program is being carried out in over 20 counties in Alabama. Kick-off meetings have been held at which time the program has been explained to the various farm and business leaders as well as to the local press, radio, and TV.

The program has made its impact felt even in the short time it has been in effect. The Soil Testing Laboratory has analyzed over 14,500 samples since January of this year, which is over twice the number of samples handled by the Laboratory during the entire year of 1958. This information comes from Dr. R. Dennis Rouse, Director of the Soil Testing Laboratory at Auburn. Dr. Rouse, as a result of this program, has been making fertilizer recommendations for maximum crop yields when requested to do so by farmers sending in the soil samples. These recommendations call for applications of considerably more fertilizer than is normally recommended on the basis of a soil test.

The National Plant Food Institute is supporting the Alabama Soil Fertility Program with a grant-in-aid of $2,000.

NOV. 8-11

Solutions Group

The Directors and Convention Planning Committee of the National Fertilizer Solutions Association met May 19 to make final commitment on this year's convention which will be held Nov. 8-10 at the Statler Hilton Hotel, St. Louis.

JUNE 9-11

TVA PILOT PLANT READY FOR DEMONSTRATION

The Tennessee Valley Authority has announced the following schedule for its pilot-plant demonstration of fertilizer technology June 9 to 11 at the Fertilizer-Munitions Development Center, Muscle Shoals, Alabama.

June 9

9:00 A. M.—Registration.

10:00 A. M.—General meeting and discussions of ammoniation granulation, and nitrogen loss.

1:30 P. M.—Demonstration of the production of 12-12-12 in the continuous ammoniator and apparatus for estimation of nitrous oxides in effluent gas.

June 10

9:00 A. M.—Discussion of production of high-nitrogen grades.

10:00 A. M.—Demonstration of the use of TVA-produced 30-10-0 in the production of 20-10-0 granular fertilizer.

1:30 P. M.—Discussion of the production of granular no-nitrogen grades.

2:30 P. M.—Demonstration of the production of 0-25-25 using the phosphate rock-phosphoric acid reaction to promote granulation.

June 11

8:45 A. M.—Liquid fertilizer conference. Talks and discussions on status of technology and recent developments.

1:30 P. M.—Demonstrations: 1. Production of 0-23-23 liquid fertilizer from caustic potash and superphosphoric acid; 2. Production of 8-24-0 liquid fertilizer from wet-process phosphoric acid by sequestering impurities with 11-33-0 made from superphosphoric acid; 3. Pumping and spraying of suspension fertilizers; 4. Exhibit of various grades of liquid and suspension fertilizers.

Members of the fertilizer industry and other interested persons are invited to attend the demonstration. Those planning to do so are requested to notify J. H. Walthall, Director of Chemical Development, Tennessee Valley Authority, Wilson Dam, Alabama.

JUNE 8-10

SOUTHERN CONTROL MEETING SESSIONS TALK FERTILIZER

When the Association of Southern Feed and Fertilizer Control Officials meet June 8-10 at the Velda Rose Motel, Hot Springs, Ark., the Tuesday open session will present matter which the fertilizer industry would find worth hearing. The other two days are the closed session Monday, and the feed session Wednesday.

Included in the program for Tuesday are these talks of special fertilizer interest:

TUESDAY, JUNE 9, 1959
General Session—Public Invited
Morning
BRUCE D. CLOANINGER, Presiding

Presidential Address by Bruce D. Cloaninger, Director, Department of Fertilizer Inspection and Analysis, Clemson Agricultural College, Clemson, South Carolina.

"Making a Must of a Miracle," Dr. R. L. Beacher, Director, Southwestern Regional Office, National Plant Food Institute, Fayetteville, Arkansas.

Afternoon
MAURICE ROWE, Presiding

"Value of County & Area Fertilizer Consumption Statistics in the Agricultural Extension Service Educational Program," Woody N. Miley, Extension Soils Specialist, Agricultural Extension Service, Little Rock, Arkansas.

"The Effects of Developments in the Fertilizer Industry on Regulatory Programs," Arthur Gentry, Plant Manager, Arkansas Plant Food Company, Little Rock, Arkansas.

"The Arkansas Soil Testing Program—Relation to Recommended Grades and the General Fertilizer Program," Dr. D. A. Hinkle, Head, Department of Agronomy, Agricultural Experiment Station, University of Arkansas, Fayetteville, Arkansas.

ERNEST A. EPPS, Presiding

"Fertilizer-Insecticide Mixtures for Control of Soil Insects in Arkansas—Good or Bad?" Grover C. Dowell, Extension Entomologist, Agricultural Extension Service, Little Rock, Arkansas.

Night
Banquet—Bruce D. Cloaninger, Toastmaster. Address by Dr. John T. Caldwell, President, University of Arkansas, Fayetteville, Arkansas.

JUNE 14-17

NPFI ANNUAL CONVENTION FEATURES FERTILIZER FUTURE

Members of the National Plant Food Institute attending the Fourth Annual Convention at The Greenbrier, White Sulphur Springs, W. Va., June 14-17, will hear nationally-known scientific authorities on the subject of "Fertilization in the Future" and members of the staff will present a comprehensive "progress report" covering Institute activities under an expanded program.

Rep. Jamie L. Whitten (D-Miss.), Chairman of the House Subcommittee on Agricultural Appropriations, will be the featured speaker on Tuesday morning, June 16. His subject will be "What's Happening in Federal Farm Programs."

Registration will begin on Sunday, June 14 and the program will get under way Monday morning, June 15.

Richard E. Bennett of Omaha, Nebraska, President of the Institute, will be the first speaker Monday, when he gives a brief progress report on the organization's activities. His talk will be followed by a panel discussion on "NPFI on the Move" with Dr. Russell Coleman, Executive Vice President of the Institute, as the moderator. Panel speakers will include: Dr. Richard B. Bahme, Western Regional Director, on "Spreading the Word About Fertilizer"; Zenas H. Beers, Midwest

JUNE 29-30

7th CALIFORNIA CONFERENCE

Sponsorship: CFA Soil Improvement Committee
University of California Campus, Davis

Monday, June 29
Chemical Building Auditorium (Room 1)
Conference Co-Chairmen — J. H. (Hank) Nelson and Earl R. Mog

9:00 A.M. Opening Remarks
Mr. Howard H. Hawkins, President, California Fertilizer Association

9:10 A.M. Welcome of Delegates and Conference to Davis Campus
Dr. Stanley B. Freeborn, Chancellor, University of California

9:20 A.M. "Fertilizer Placement for Bed Grown Vegetables"
Dr. O. A. Lorenz, Vice Chairman, Department of Vegetable Crops, Davis-Riverside

9:45 A.M. "Some Aspects of Fruit Nutrition"
Dr. Omund Lilleland, Pomologist, Department of Pomology, University of California, Davis, California

10:10 A.M. Recess

10:20 A.M. "Status of Major Element Nutrition of Grapes in California"
Dr. James A. Cook, Viticulturist, Department of Viticulture, University of California, Davis, California

10:45 A.M. "California Fertilizer Statistics"
Mr. Robert Z. Rollins, Chief, California Bureau of Chemistry, Sacramento, California

11:10 A.M. "Nutrient Deficiencies in Fruit Tree Crops" —Color Slides
Dr. Aldo D. Rizzi, Extension Pomologist, University of California, Davis, California

12:30 Luncheon on lawn north of the Commons, adjacent to Memorial Union, on the Quadrangle
Buffet luncheon, featuring hot beef ragout, $1.50 per plate, incl. tax & tip.

2:30 P.M. Campus Tour
—Arrangements by Dr. J. E. Knott

7:30 P.M. Banquet—El Rancho, Sacramento, "California's Changing Agriculture Pattern"
Dr. Daniel G. Aldrich Jr., Dean of Agriculture, University of California, Berkeley, California
Dinner feature—Breast of Capon, $3.50, incl. tax & tip.

Tuesday, June 30 — Hunt Hall

9:00 A.M. All delegates will meet in Room 100, where they will be made up into two groups, for the two panel discussions. The panels will rotate between the two audiences, one of which will convene in Room 137.

PANEL ON TREE FRUIT AND VINE NUTRITION
MODERATOR—Mr. Millard E. McCollam, American Potash Institute, Inc.
PANEL MEMBERS
Dr. Ormund Lilleland, Pomologist, University of California, Davis, California
Dr. Carl J. Hansen, Pomologist, University of California, Davis, California
Dr. Aldo D. Rizzi, Extension Pomologist, University of California, Davis, California
Dr. James A. Cook, Viticulturist, University of California, Davis, California
Mr. Vincent E. Petrucci, Head, Viticulture Department, Fresno State College

PANEL ON FERTILIZER PLACEMENT
MODERATOR—Dr. J. E. Knott, Chairman, Department of Vegetable Crops, University of California, Davis, California
PANEL MEMBERS
Dr. Malcolm H. McVickar, Chief Agronomist, California Spray-Chemical Corporation, Richmond, California
Dr. O. A. Lorenz, Vice Chairman, Department of Vegetable Crops, University of California, Davis, California
Dr. D. S. Mikkelsen, Associate Agronomist, Department of Agronomy, University of California, Davis, California
Dr. John C. Lingle, Department of Vegetable Crops, University of California, Davis, California
Dr. F. J. Hills, Extension Agronomist, University of California, Davis, California

Regional Director, on "Raising Farmers' Sights"; Dr. Samuel L. Tisdale, Southeast Regional Director, on "The Intensified Approach to the Fertilizer Market," all representing the Institute. Dr. R. A. King, Professor, Department of Agricultural Economics, North Carolina State University, Raleigh, and Dr. M. S. Williams, Chief Agricultural Economist for the Institute, will discuss "Predicting Next Year's Fertilizer Sales" as part of the panel.

The annual business meeting of the Institute will follow.

Monday afternoon, June 15 program will be "Fertilization in the Future" with W. R. Allstetter, Vice President of the Institute, as moderator and speakers as follows: Dr. L. D. Baver, Director, Experiment Station of the Hawaiian Sugar Planters' Association, Honolulu, on "Scientific Feeding of High Value Crops;" Dr. J. Fielding Reed, Southern Manager, American Potash Institute, Inc., Atlanta, on "Converting Low Value Crops into High Value Crops;" and Dr. R. J. Hildreth, Research Coordinator for West Texas, Texas Agricultural Experiment Station, Lubbock, on "Minimizing Weather Risks with Fertilizer."

Tuesday morning, June 16 program will begin with the showing of the Institute's new film, "Cash in on Grass" followed by addresses on "What's Happening Down on the Farm" by Earl F. Crouse, Farm Business Council, Urbana, Ill., and "What's Happening in Federal Farm Programs" by Rep. Whitten.

The annual banquet of the Institute will be held on Tuesday evening, at which winners in the "Soil Builders Award for Editors" contest will receive scrolls.

Officials of the Institute estimate attendance at the convention will approximate 1,000 persons consisting of members, prominent agricultural leaders in business, government and communications.

JULY 7-9

PACIFIC N.W. MEET AT TACOMA, WASH.

WINTHROP HOTEL

PROGRAM — TUESDAY, JULY 7

8:00- 9:00 Registration.
Moderator: D. F. Allmendinger, Supt., Western Washington AES.

9:20- 9:40 Economics of Fertilizer Usage in the Pacific Northwest. M. S. Williams, NPFI.

9:40-10:00 Washington's Fertile Opportunities in Soil Fertility. C. B. Harston, AES, WSC.

10:00-10:20 Projection of Significant Correlation Data of Fertilizer Experiments, I.M. Louset, WSC.

10:30-10:50 Cooperative Soil Testing and Forest Fertilization Research Project at WSC. W. A. Starr and A. R. Halvorson, WSC.

10:50-11:10 Present Status and Needs of Forest Fertility Research. S. P. Gossel, University of Washington.

11:10-11:30 Soil Organisms and Plant Health. J. D. Menzies, USDA, Irrigation Experiment Station.

11:30-11:40 Soil Sampling for Soil Testing. A. R. Halvorson, WSC.

12:10- 1:30 Luncheon
M.C.: Jack Wursten, Simplot Soilbuilders, Inc., Idaho Falls, Idaho.
Addresses:
Ten Years—a look back. George Wickstrom, American Potash Institute, Columbia, Mo.
Ten Years—a look ahead. Karl Baur, Pacific Cooperative Supply, Portland, Ore.

P.M.

1:40- 5:00 Field Trip. F. T. Tremblay, Northwest Representative, NPFI, in charge of tour.

WEDNESDAY, JULY 8

Moderator, G. O. Baker, Dept. of Agronomy, University of Idaho.

8:40- 9:00 Interactions—Their Meaning and Significance. H. B. Cheney, Head, Soils Dept., Oregon State.

9:00- 9:20 Good, Better, and Best Fertilization for Western Washington. Western Washington AES.

9:20- 9:40 Lime and Phosphorus Interactions Affecting the Production of Legumes in the Willamette Valley. T. L. Jackson, Soils Dept., Oregon State.

9:40-10:10 Alfalfa Response to Lime and Sulfur on a High Magnesium Soil in Southern Oregon. John Yungen, So. Oregon Branch, AES.

10:30-10:50 Fertilizer Interactions in Wheat Producing Areas of Eastern Washington. F. E. Koehler, Dept. of Agronomy, WSC.

10:50-11:10 Residual Nitrogen Response with Wheat in Eastern Oregon. Charles M. Smith, SWC-ARS, Pendleton Branch.

11:10-11:40 Behavior of Water Soluble Phosphates in Soils. Willard Lindsay TVA, Wilson Dam, Alabama, and Merle Switzer, TVA, WSC,

11:40-11:50 Discussion.

12:00- 1:30 Luncheon. M.C.: Frank Taylor, Oregon-Washington Fertilizer Company, Seattle Wash.
Address: The Effect of Urbanization on Western Washington Agriculture. Ralph V. Backstrom, Asst. Director, Industrial and Agricultural Development, Great Northern Railway.

P.M.

Moderator: Scott Hanson, Collier Carbon and Chemical Corp., Yakima, Wash.

1:40- 2:00 The Changing Trends in Turf Fertilization. Roy Goss, Western Washington AES.

2:00- 2:20 The Fertilization of Irrigated Grass and Grass-clover Pastures on Vancouver Island with Emphasis on Nitrogen Application and Chemical and Botanical Composition of the Herbage. Hugh Gardner, Soils Department, Oregon State.

2:20- 2:40 Nitrogen Versus Ladino Clover for Milk Production. H. M. Austenson, Western Washington AES.

2:40- 3:00 Effects of High Rates of Nitrogen Application on Yield of Pastures and Removal of Plant Nutrients. W. P. Mortensen, Western Washington AES.

PACIFIC NORTHWEST

(Continued)

3:10- 3:30	Relation of Soil Moisture to Forage Crop Production in Western Washington. Darrell Turner, Western Washington AES.
3:30- 3:50	How Do Plants Feed? Nels Benson, Tree Fruit Experiment Station.
3:50- 4:10	Movement of Sulfur as Sulfate in Soils, Moyle Harwood, Soils Department, Oregon State.
4:10- 4:30	Comparison of the Quantity and Quality of Hay Produced from Native Mountain Meadow Fertilized with Three Sources of Nitrogen. Rulon D. Lewis, USDA, Univ. of Wyoming.
5:00- 6:00	Allied Trades Cocktail Hour.
6:00- 9:00	Banquet.

THURSDAY, JULY 9

Technical Session. Moderator: H. B. Cheney, Head, Soils Department, Oregon State.

8:40- 9:00	Summary of Soil Analysis-Plant Analysis Studies in Western Washington, 1940-1952. F. T. Tremblay, NPFI.
9:00- 9:20	Correlation of Boron Tests with Response to Boron Fertilization. Aaron Baker, Western Washington AES.
9:20- 9:40	Interpretation of Soil Moisture and Nitrate Tests for Nitrogen Fertilization on Wheat. Glen Leggett, USDA, Irrigation Experiment Station.
9:40-10:00	How to Make Tissue Tests on Some Major Crops. George Wickstrom, American Potash Institute.
10:10-10:30	Results of Soil Sampling Contest. A. R. Halvorson, WSC.
10:30-11:30	Correlation of Soil Tests with Field Response to Applied Fertilization in Washington, in Oregon, in Idaho.
11:30	Announcements. Adjournment.

JULY 15-18 SW Fertilizer Conference At Galveston, Texas

WEDNESDAY, JULY 15—Afternoon & Evening

1:00	Registration—Lobby Galvez Hotel Fee: Men $15—Ladies $10.
6:30- 8:00	Reception—Honoring Technical and Control Groups—Galvez Poolside Patio.

THURSDAY, JULY 16—Morning

8:00	Registration—Lobby Galvez Hotel.
9:00	General Session—Grecian Room — Galvez Hotel. Stanley Hackett, presiding. Speakers: Dr. Russell Coleman, Exec. Vice President, Nat. Plant Food Inst., Washington, D. C. Dr. R. L. Beacher, Southwestern Regional Mgr., NPFI, Fayetteville, Ark. Ralph Johnson, Leader, Extension Agronomist, Georgia Agricultural Extension Service, Athens, Georgia. Dr. J. Q. Lynd, Soil Fertility Agronomy Dept., Okla. State University, Stillwater, Okla. Jack Timmons, Commercial Manager, Radio Station KWKH, Shreveport, La.

THURSDAY AFTERNOON AND EVENING

12:30	Ladies Social and Luncheon. Galvez Club, Galvez Hotel.
2:00	Ladies Bridge and Canasta Tournament. Palm Room, Galvez.
1:30	Golf Tournament—Country Club. Douglas Kelly, Chairman.
2:00	Shuffleboard Tournament — Pool Patio, Galvez (Open to Men and Women), Jack Lindsey, Chairman.
7:00- 8:00	Social Hour, Terrace Room, Galvez.
8:00	Buffet Dinner and Dance, Grecian Room, Galvez.

FRIDAY, JULY 17—Morning

(No registration for this meeting)

9:30	Annual Fertilizer Grade Hearing—Control Officials of Arkansas, Louisiana, New Mexico, Oklahoma and Texas cooperating.

SATURDAY, JULY 18

Sporting Activities — Deep Sea Fishing; Bay Fishing; Pier Fishing; Boat Excursion; Golf.

S. W. Planning Committee Meeting

The Planning Committee of the Southwestern Fertilizer Conference and Grade Hearing met in Galveston May 9 to work out details for the Southwestern Conference at the Galvez Hotel, Galveston, Texas, July 15-18.

Theme of the program effort will be to emphasize "The Weakest Link" of the fertilizer industry. A serious effort will be made to give all those attending some facts and figures to help upgrade the sales and profits of the industry. The program should be of the utmost interest to all fertilizer manufacturers and their representatives.

Reservations should be made with the Galvez Hotel, Galveston, Texas. This is a family meeting—wives and children are invited.

Those attending planning meeting of the Southwestern Fertilizer Conference, Galveston, Texas: Stanley Hackett, Dixie Fert. Co., Shreveport; Stafford Beaubouf, Grand River Chem. Div., John Deere & Co., Pryor, Okla.; Mrs. Hackett; Dr. J. F. Fudge, State Chemist, Texas; Jimmy Powledge, National Hotels; Mrs. Fudge; Mrs. Doug Kelly & Doug Kelly, Monsanto Chem., El Dorado, Ark.; Mrs. Morgan & Dr. N. D. Morgan, Amer. Potash Inst., Shreveport. Not shown are commiteee members: Mr. & Mrs. Jordan Thorne, Grand River Chem. Div., Deere & Co., Pryor, Okla.; Mr. & Mrs. Mike Wells, Armour Fertilizer Works, Dallas, Texas; Mr. & Mrs. Floyd Prather, Central Texas Fertilizer Co., Comanche, Texas; Mr. & Mrs. Jack Lindsey, International Minerals & Chemical Corp., Shreveport, La.; Dr. & Mrs. R. L. Beacher, NPFI, Fayetteville, Ark.
Right: Swimming pool at Galvez Hotel where convention will be held.

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I use – or plan to use:

☐ Ammonia, Nitrogen Solutions

☐ Phosphatic Fertilizer Solutions ☐ Sulfuric Acid

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corporation
99 Park Avenue, New York 16, N. Y.

YOU GET ALL THREE

1. TRIPLE SUPERPHOSPHATE

Run-of-Pile

High porosity—high water soluble P_2O_5. Low moisture content and correct size distribution.

Granular

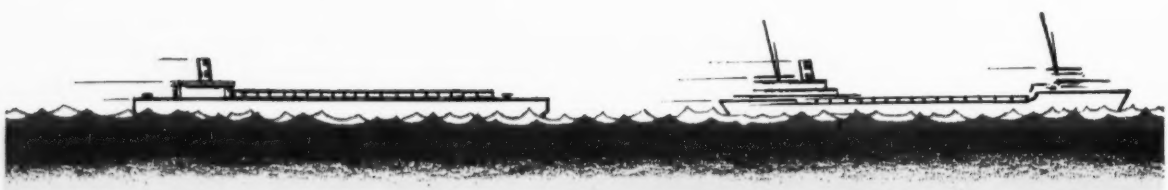
Uniform particle size, dust free, low moisture content—will not cake or lump under normal storage conditions. Guaranteed 46% Phosphoric Acid—available in bags or bulk.

Coarse

Controlled screen size honeycomb structure, high water soluble P_2O_5—for intermediate ammoniation to produce a semi-granular product.

3. PHOSPHORIC ACID

A product of highest purity—manufactured to the following specifications 52-54% P_2O_5—solids less than 1% by weight—specific gravity (60°F.) 1.68 — 1.73.



WAREHOUSES TO BETTER SERVE YOU–

Our centrally located warehouses enable us to give faster service to our customers, and particularly so in emergency cases. Stocks of Triple Superphosphate are warehoused in Peoria, Illinois, Winona, Minnesota and St. Paul, Minnesota. These warehouses are maintained to facilitate faster delivery to the fertilizer industry when time is an important factor.

FROM USPP !

Plus — see next page →

2. DT-MON A modified Di-ammonium Phosphate

18-46-0 Granular

A granular product of uniform particle size and guaranteed chemical analysis. Used efficiently and economically in producing most high analysis formulations and is particularly suited for ultra high analysis.

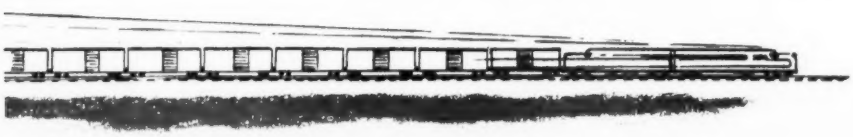
DELIVERY SERVICE

If you can be served by water, USPP can serve you best. We maintain our own docks on Tampa Bay and your ship sails in a minimum of time, and of course, our trunk line rail connection is only minutes away.

For scheduling and requirements – Contact our

Sales Agents

BRADLEY & BAKER



U.S. PHOSPHORIC PRODUCTS

TAMPA, FLORIDA

Division

TENNESSEE TC TENNESSEE CORPORATION CORPORATION

USPP

TECHNICAL SERVICE

Our field staff of technical representatives, with a thorough background in phosphate products and their applications in the fertilizer industry, are anxious to assist you in developing a more efficient and profitable operation. These technicians are conveniently located in the Midwest and are ready to serve you in a minimum of time — For their services, Contact BRADLEY & BAKER.

For scheduling and requirements – Contact our

Sales Agents
BRADLEY & BAKER

U.S. PHOSPHORIC PRODUCTS
TAMPA, FLORIDA
Division
TENNESSEE TC CORPORATION

CALIFORNIA

New "500" liquid fertilizer, developed by Agricultural and Animal Products Sales, Nutrilite Products, Inc., Buena Park, California is now available, according to the manufacturers. The new product contains fortified organic fish concentrate, chelated trace minerals, acidifier, penetrant, and claims a higher percentage of active ingredients than most competitive products. "500" is packaged in 1 gallon, 1 quart, 1 pint and 4 ounce sizes.

Calspray's Hanford plant caused evacuation of residents for five blocks around as a hose carrying liquid ammonia burst. Quick action prevented a more serious distribution, but 6,000 pounds of a 36,000 pound load were lost.

COLORADO

Western Fertilizer, Inc., has been incorporated at Burlington by Donald A., Jeanne and J. M. Caldwell.

ILLINOIS

Stanford Fertilizers have erected at Stanford a bulk and bag warehouse equipped to supply any desired grades of fertilizer. The operation is managed by **William Otto.**

* * *

Clinton County Service Co., Breese, have built a blending plant at their present warehouse, where bulk storage faciilties have been maintained.

The Coronet Phosphate Company celebrated its 50th anniversary and the 75th anniversary of the founding of Plant City, Florida, with this colorful float. The Coronet mine and defluorinating production facilities are located at Plant City.

Around the Map

KENTUCKY

Ohio Valley Fertilizer, Maysville, May 11 suffered a $300,000 fire, punctuated by three explosions of empty 10,000 gallon tanks, set off by the intense heat of the fire, according to office manager, **Charles Tumlin.**

Plant manager **Gilbert Nooe,** said that the company definitely plans to rebuild, and meanwhile is hauling in fertilizer from other plants. The same concern operate the **Burley Belt Fertilizer Co.** in Lexington. The destroyed plant was built in 1952.

MAINE

Maine Reduction Co., Bangor, has begun shipment of the fertilizer it produces from tannery leather cuttings and old shoe leather. **Joseph J. Grady,** owner, says the leather is cooked under high pressure, steam dried and ground fine—and produces a booster-type fertilizer which contains 12% nitrogen. Mr. Grady and his plant superintendent, **George Thurston** have operated similar plants in Massachusetts and in Virginia.

MARYLAND

MINNESOTA

North Star Chemicals has begun construction of a 240 daily ton sulphuric acid plant, which is expected to be the first of its kind to be operated in the state. **Titlestead Corp.** are responsible for engineering and plant. It is expected to be in production this Fall.

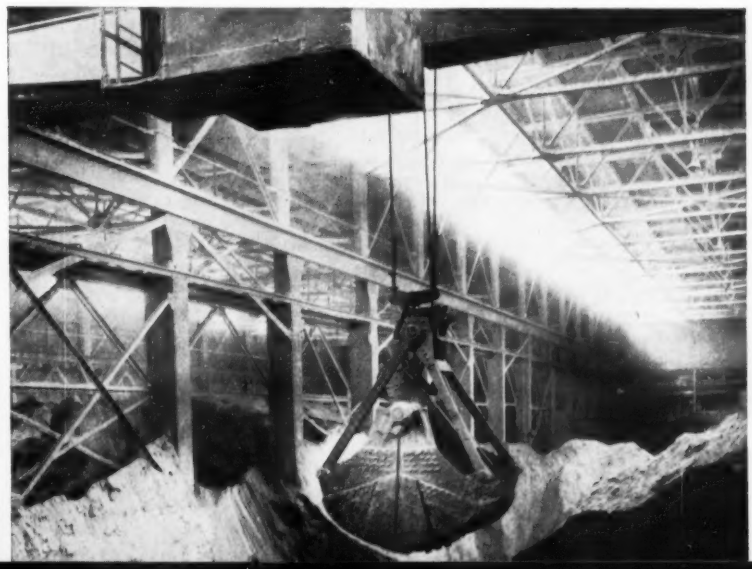
MISSISSIPPI

Magee Cooperative, Magee, has been given a safety award by **Hartford Accident and Indemnity Co.** for 71,000 man hours in 1958 without a lost time accident. The cooperative, under the management of **Marvin Calder** has been conducting a control program.

PENNSYLVANIA

General Dynamics and **Philadelphia & Reading** are discussing a jointly owned operation to produce chemicals, including ammonia, ammonium nitrate, urea, primarily for bulk sales to the chemical industries. The raw material would be anthracite mining wastes and residues, and the plant would be located at Pottsville, where such waste exists

Two-line chemical plant type buckets like this are used by W. R. Grace & Co., Davison Chemical Division, for raw materials and product handling in its normal superphosphate plant at Curtis Bay, Md. Grace's Curtis Bay facilities for producing superphosphate, an agricultural chemical, are the largest in the world under a single roof. The 3½-cubic-yard buckets, made by Blaw-Knox Company, Pittsburgh, are reeved with five parts of line, and equipped with alloy steel lips and drop forged chrome nickel teeth. A style "A" equalizer eliminates bucket twist. Five of the Size 740-S units, each of which operates from a 75-foot span bridge crane, are used in the storage and reclamation of phosphate rock and finished superphosphate products. All of these buckets have shown excellent digging capabilities in these applications.



board chairman, said it was to be the most modern and efficient of its kind. This policy has been scrupulously carried out.

Today the surface construction has reached 45% completion, and the shaft itself is 36% complete. As our readers will remember, the plan was to freeze the first 300 feet, and to grout below that point. It has now been found wise to carry the freezing to the Bisaltmore water-bearing section also, another 200 feet of depth.

Construction costs are running true to estimates, which were for $17,000,000. Later an additional investment of $8,000,000 should be warranted by demand, to increase mine and plant capacity.

* * *

Canadian Industries Ltd. will take steps to increase floor of space in an office building planned for Montreal.

* * *

Dominion Foundries and Steel Ltd., Hamilton, Ont. have ordered a thirty-ton plate from **Lewis Foundry** with a capacity of 18 daily tons of ingots. With this is the prime purpose of the $2,000,000 investment, the plant will also produce a large volume of nitrogen, which will be used in the recently completed ammonia plant of **Dominion Glass Co. Ltd.** Operation is expected in July.

ENGLAND

Dunn, with offices in London and Paris, announces that it has formed a Standard Motor Products Ltd. with **Lee Motor Products Ltd.** of the **National Power Units** group, to handle the manufacture and sale of the Dunn Electric Starter Motor and Dunn Electric Starter Drive. Dunn's Managing Director, **A. J. Dunn**, will be Managing Director of the new company.

GREECE

The Dow Chemical Company has signed an agreement with the Italian firm, Montecatini, to build a $20,000,000 plant in Greece. Dow's Dr. Joseph C. Rhea, Dow's vice president in charge of the Dow International organization, announced the signing of the agreement in Athens. The plant, which will be built by Montecatini, will produce 100,000 tons of ammonia annually, 60,000 tons of which will be converted into urea. The remainder will be used in the production of nitrogen solutions and ammonium nitrate.

Miles and miles of new fertilizer markets. Parkway highways are the new look of the Interstate System—beautiful as well as useful

The Dow plant will be the largest fertilizer plant in Greece. Its annual production will be 100,000 tons of urea and 60,000 tons of nitrogen solutions—a volume which would take care of current Greek agricultural needs.

PAKISTAN

East Pakistan's first fertilizer project at Fechuganj is now under construction, with Japanese technicians in charge of the work.

Monsanto Staff Gets DuBois Award

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The awards were presented by J. J. Christian, Monsanto vice president and division general manager. All of the recipients are members of the division's research department staff. Four of the awards went to individuals, a fifth was presented to a group.

The group award went to seven scientists in their continuing research on the development of Monsanto processes in the manufacture of industrial and agricultural ammonium nitrate solutions. The group includes D. L. Griffith, D. C. Bone, D. J. Hickam, J. L. Lee, J. E. Pratt, C. J. Schumacher and J. McCue.

Laboratory Dedication A Correction

Return postage guaranteed

The International Scene

CANADA

Sales up 8% 1957-58

Total sales of fertilizers in Canada rose nearly 8% during the 1957-58 fertilizer year to 870,539 short tons, 689,566 tons of mixed fertilizers, and 181,973 tons of materials. Exports, which amounted to 42,706 tons of mixtures and 885,064 tons of materials, were principally ammonium sulfate, ammonium nitrate, calcium cyanamide, and ammonium phosphates. Approximately 80 percent went to the United States, including Hawaii and Alaska.

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$5,000,000 Credit Aids Suez Plant

With a $5,000,000 credit from the Export-Import Bank in Washington, an Egyptian company is going to greatly enlarge its chemical fertilizer plant at Suez. It will expand its ammonia production facilities by 50 per cent. The firm, through a previous "Eximbank" loan, since repaid, developed a plant complete with a school, workers' family apartments, a hospital, mosque, commissary and other benefits supporting everyday needs of the workers.

KOREA

Distribution Plans Unchanged

The proposal to channel Government imports of fertilizer through a single agency has been judged undesirable at this time. Minister Hyun Hwak Shin said that it is not desirable to make any changes at the height of present distribution operations, and even when changes are considered various other problems should be considered carefully. The Office of Supply had suggested that a single channel would cut costs and permit more expeditious distribution.

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Phosphate Deposits being Examined

Phosphate deposits on the southeast side of the island of Aruba are being examined to determine whether they are extensive enough and whether the phosphate is of sufficiently high grade to warrant resumption of mining which stopped during World War I. Preliminary investigations have been encouraging. Consideration also is being given to establishing a chemical plant for processing the phosphate.

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If Peruvian plans all mature, there is a big rise in locally produced synthetic fertilizers ahead. At Callao the first plant is due to go into production soon with 25,000 annual tons of ammonium nitrate. The Government is planning a $6,000,000 plant to produce up to 20,000 annual tons of 46% urea. A Peruvian firm has begun negotiations with a Japanese group for a $16,500,000 plant which is to produce 40,000 annual tons of ammonium nitrate and 20,000 of urea.

SOUTH AFRICA

Supplies Nearly all N Needs

South Africa may expect, in the very near future, to be practically independent of overseas markets as far as nitrogen is concerned, it was stated at the opening of the African Explosives and Chemical Industrial fertilizer factory at Umbogintwini. The consumption of fertilisers in the Union increased from 300,000 tons in 1943 to 1,000,000 tons in 1958. Of this amount more than three quarters were manufactured by African Explosives and Chemical Industries' two factories at Umbogintwini and Somerset West.

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LEONARD CONSTRUCTION COMPANY

ENGINEERS & CONSTRUCTORS

PLANTS FOR

SULFURIC ACID, ACID DILUTION, AMMONIUM SULPHATE
SUPERPHOSPHATE, TRIPLE SUPERPHOSPHATE, PHOSPHORIC ACID

37 SOUTH WABASH AVE. — CHICAGO, ZONE 3, ILLINOIS

PHONE - STATE 2-5041 CABLE - LEOCONCO

Barbara Ann Freie, the first girl ever to win the National Plant Food Institute Agronomy Achievement Award, is shown receiving a plaque from Dr. W. H. Pierre, Head of the Iowa State College agronomy department. Miss Freie, a sophomore student in agronomy, received a scholarship for $200 and an engraved key, while the plaque, which is inscribed with her name, remains on display at the college.

in good quantities.

Management and sales would be under the jurisdiction of **Rex Nicholson,** president of **Liquid Carbonics** division of General Dynamics. The plant would employ the Lurgi process, which has been proven through several years of use in Germany.

TENNESSEE

Monsanto Chemical Company's Inorganic Chemical division has begun extensive modernization of its elemental phosphorus plant at Columbia, **Edward J. Bock,** division assistant general manager, announced last month.

Construction now underway is part of a long range program of expansion for the plant. Initial work includes installation of facilities for the prevention of air and stream pollution, as well as other facilities for the preparation and processing of phosphate rock into elemental phosphorus, and is to be completed in about eight months.

TEXAS

Solid Nitrogen Co., are planning a $10,000,000 ammonia-urea operation at Freeport. It is reported that **Chemical Construction** will build the plant.

UTAH

Delhi-Taylor's potash reserves near Moab, they report, are more valuable and exploitable than their Saskatchewan holdings. They have not reported details, except that the potash is high grade.

CANADA

International Minerals & Chemical expect completion of all construction, shaft and surface by late 1960 on their Esterhazy, Saskatchewan, potash mine. This was begun in 1957 and at the time **Louis Ware,** board chairman, said it was to be the most modern and efficient of its kind. This policy has been scrupulously carried out.

Today the surface construction has reached 45% completion, and the shaft itself is 36% complete. As our readers will remember, the plan was to freeze the first 300 feet, and to grout below that point. It has now been found wise to carry the freezing to the Blairmore water-bearing section also, another 200 feet of depth.

Construction costs are running true to estimates, which were for $17,000,000. Later an additional investment of $8,000,000 should be warranted by demand, to increase mine and plant capacity.

* * *

Canadian Industries Ltd will take twelve to fourteen floors of space in an office building planned for Montreal.

* * *

Dominion Foundries and Steel Ltd., Hamilton, Ont. have ordered a third Oxyton plant from **L'Air Liquide,** with a capacity of 150 daily tons of oxygen. While this is the prime purpose of the $2,000,000 investment, the plant will also produce a large volume of nitrogen, which will be used by the recently completed adjacent plant of **Cyanamid of Canada, Ltd.** Operation is expected by July 1.

ENGLAND

Fisons will officially open their ammonium nitrate plant at Stanford-le-Hope June 9, with **Lord Netherhope,** president of the **National Farmers Union,** doing the honors.

* * *

Dow Chemical's foreign subsidiary, Dow Agrochemicals Ltd., is now ready to build in Norfolk a $2,800,000 plant. Under the direction of **W. E. Ripper,** British authority, the subsidiary was established to sell their weed killer in Britain, the Commonwealth and other countries outside the USA.

GREECE

The Greek Board of Economic Cooperation has signed with the Italian firm, Ammonia Casale, and the West German firm, Friedrich Uhde, to build a $38,000,000 nitrogen fertilizer plant in West Macedon, which from lignite materials would produce some 300,000 annual metric tons—a volume which would take care of current Greek agricultural needs.

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Laboratory Dedication At Connecticut AES

Edmund W. Sinnott, Sterling Professor Emeritus of Botany at Yale University, will be one of the principal speakers June 9 during ceremonies marking the dedication of Slate Laboratory, named in recognition of William L. Slate, director emeritus, the new building at The Connecticut Agricultural Experiment Station, New Haven.

Formal presentation of the new laboratory will be at 4 p.m. when Commissioner of Agriculture Joseph N. Gill, representing Governor Ribicoff, hands the keys to Director James G. Horsfall of the Station.

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SUPERPHOSPHATE, TRIPLE SUPERPHOSPHATE, PHOSPHORIC ACID

37 SOUTH WABASH AVE. — CHICAGO, ZONE 3, ILLINOIS

PHONE - STATE 2-5041 CABLE - LEOCONCO

"Great, Bill...this SPM

...it took Bill just 15 minutes to review the Sul-Po-Mag program and magnesium story.

Alf Oines (right), and Bob Freske (center), president and vice-president of the Michiana Chemical Co., of Niles, Michigan, will continue to profit from the SPM program. They're shown here with Bill Lane, IMC Potash sales representative.

3. *"Bill, you may recall that we recently used various elements of your program . . . mailers, envelope stuffers . . . and found them very helpful in pushing our own brand. And we may want to take advantage of your imprinting service on some of the other materials."*

4. "Here are examples of our Sul-Po-Mag editorial ads that are being run in farm publications this year. Each ad creates awareness of a need for magnesium . . . tells farmers the name of the product that corrects or prevents it . . . and displays the seal as the sign of Sul-Po-Mag."

Ask your IMC potash representative how the Sul-Po-Mag seal program can help boost your fertilizer sales

From its start several years ago, International's Sul-Po-Mag sales program has rapidly gained momentum. Sul-Po-Mag is well accepted as the ingredient in your mixed fertilizers to prevent and help correct magnesium deficiencies.

The SPM program is supported by full-scale national and local informational and product advertising. Ads written for specific crops are directed to growers throughout the nation. Growers of tobacco, potatoes, fruits and vegetables are all receiving SPM information. These magazine ads are backed up by radio commercials, direct mail, and publicity. Also, a large amount of work is being done to promote magnesium through influence groups such as county agents, vo-ag teachers and agricultural extension people.

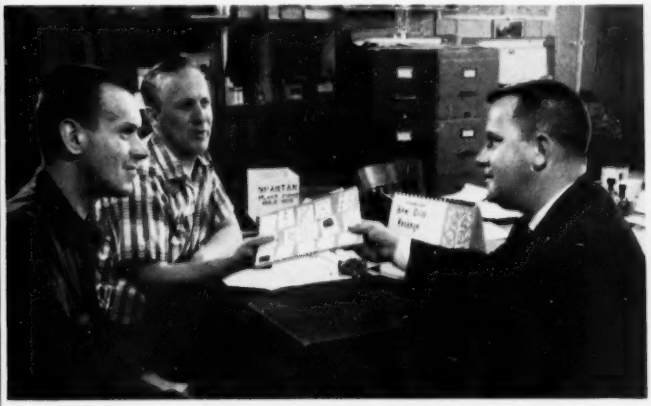
The net effect . . . growers and influence groups are becoming more acquainted with the growing problem of magnesium deficiency. Sul-Po-Mag is widely recognized as the best way to combat magnesium shortages. As a result more and more growers are looking for the SPM seal on the mixed fertilizers they buy.

Fertilizer manufacturers using Sul-Po-Mag can take advantage of this promotion by identifying themselves and their products with newspaper ad mats, tags, seal imprints, imprinted direct mail pieces and posters . . . all available at no cost. For full information on the SPM program — and for information on IMC's full line of potash products — contact your International representative or write c/o the address at right.

program should really help sales!"

1. "The SPM informational advertising program has made a terrific impact on the market. As an example, we've received requests for product information from thousands of large growers and influence people. It indicates to us that growers are becoming more and more interested in magnesium."

2. "Although our advertising is primarily informational, we use the seal in each ad to acquaint buyers with the sign that identifies fertilizer with Sul-Po-Mag. As you know the SPM seal is available in printing plates, proofs, stickers, or tags so you can take advantage of our Sul-Po-Mag promotion."



5. *"Sounds interesting, Bill . . . but could you leave this brochure with us? We would like to look it over and study your program in detail. I'm sure your materials may fit into our own advertising program."*

6. "Thanks for your time, Alf and Bob. I'll keep you informed on everything new in our program, but if you have any questions or would like to use some materials, just let me know."

By including Sul-Po-Mag as your source of magnesium and sulphate of potash in your mixed fertilizers, you'll profit from this hard-working sales promotion campaign.

HERE'S THE FULL LINE OF IMC POTASH PRODUCTS

Standard Muriate of Potash | Coarse Muriate of Potash | Granular Muriate of Potash | Sulphate of Potash | SUL-PO-MAG® double Sulphate of Potash-Magnesia

MINERALS International CHEMICALS

PRODUCERS OF LIVING MINERALS

26-59 R

POTASH DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Administrative Center: Skokie, Illinois

Side view of the new solids plant at Ketona before opening, showing loading area, ramp, and short prilling tower. Bagged ammonium nitrate can be loaded into three trucks at the same time at the new solids plant; Retractable conveyors aid in loading.

New Features Mark Ketona Chemical Plant

Ketona Chemical Corporation has announced the first commercial production of prilled solid nitrate fertilizers from its new nitrate plant at Ketona, Alabama, a few miles northeast of Birmingham.

Initial runs from the modern new plant were of a high analysis, 33.5% ammonium nitrate fertilizer. Later runs were of the 20.5% limed ammonium nitrate. The products are being marketed in the Southeast under the "Harvest Giant" trade name.

Ketona Chemical Corporation is owned jointly by Alabama By-Products Corporation, Birmingham, and Hercules Powder Company, Wilmington, Delaware. Design of the new plant was by Chemical & Industrial Corporation.

The new solids unit is located within Ketona's ammonia plant which was the first outside Europe to produce anhydrous ammonia exclusively from coke-oven gas. The coke-oven gas comes from Alabama By-Products' large merchant by-product coke oven plant at nearby Tarrant, Alabama, where ABC produces metallurgical coke, principally from its own coals.

The new Ketona plant utilizes a truncated prilling tower only one-fourth as high as older design plants.

The new plant at Ketona makes prilled ammonium nitrate and a 60-40 prilled ammonium nitrate limestone mixture. It has a capacity of 75 tons per day.

Technically, the new process at Ketona involves more than simply chopping off the upper three-fourths of the prilling tower. Use of a short tower is possible by first using a falling film evaporator to concentrate ammonium nitrate liquor so that it is almost free of water before it is sprayed into the prilling section.

Operation of the plant is much the same whether it is turning out plain ammonium nitrate or limed ammonium nitrate with the exception that in the latter case finely-ground dolomitic limestone is added before prilling.

Raw materials such as ammonia and nitric acid are produced at Ketona by existing facilities. Ammonium nitrate solution is produced in the regular way, as an 83% liquor and is evaporated to an almost anhydrous melt of approximately 99.5+% concentration. Pulverized limestone, brought in from a nearby quarry, is mixed with the melt in steam-heated tanks, in a ratio of approximately 60% nitrate to 40% limestone.

Briefly, the operation of the process is as follows:

The molten ammonium nitrate is sprayed through the prilling tower, where it falls countercurrent to an air stream. The droplets, after they form solid pellets or prills by cooling, are collected at the bottom of the tower. From here, they go through a rotating cooler before being screened and bagged.

This manufacturing process produces a prilled ammonium nitrate more dense than conventional material and thus offers advantages of high density.

AAC Wins 8th Award

The American Agricultural Chemical Company has been recognized, for the eighth consecutive year, by the American Institute of Management, for its "distinguished accomplishment in the ten categories of the Management Audit" conducted by the Institute.

The ten factors bearing on the award are 1) Economic function, 2) Corporate structure, 3) Health of earnings, 4) Service to stockholders, 5) Research and Development, 6) Directorate analysis, 7) Fiscal policies, 8) Production efficiency, 9) Sales vigor, and 10) Executive evaluation.

Cyanamid Demonstrates Urea on Various Crops

To show the farmer the fertilizer advantages of urea, American Cyanamid has set up a series of 250 demonstrations on various crops in the Northeast and Midwest. There are also 13 long-range grass fertilization and feed-out trials on grass forage going on. The program is pointed especially at areas where legumes do not do well consistently, because of soil or climatic conditions.

H. H. Nau, company agronomist, is in charge of the network of demonstrations, according to T. R. Cox, manager of the firm's plant nutrient development program. F. A. Raymaley, forage specialist, is supervising the grassland program.

Raymond Bag Adds Facilities At Halifax

The installation of new manufacturing equipment at the Halifax Paper Company at Roanoke Rapids, N. C. will "mean further insurance of adequate kraft paper supplies for all our production requirements", according to J. R. Clements, president of the Raymond Bag Corporation.

Both Raymond and Halifax are divisions of the Albemarle Paper Manufacturing Co., Inc. of Richmond, Virginia. Halifax is a paper supplier for Raymond's production of multi-wall bags.

The new equipment, scheduled to begin operation about June 1, will almost double Halifax kraft paper production. Initial production scheduled for the new unit will be about 250 tons of kraft paper and paperboard daily, with a maximum capacity of more than 425 tons.

with TRONA'S*
new, specially-sized
granular
POTASH

Quality fertilizer granulation begins with **Trona**'s all-new, specially-sized granular muriate of potash. The carefully regulated and controlled screen size results in reduced segregation and uniformity of finished product. Whatever your mixing method—batch or ammoniation, **Trona**'s new **granular** assures a quality fertilizer uniform in particle size.

TRONA **American Potash & Chemical Corporation**

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New York Office: 99 Park Avenue, New York 16, New York
Plants: TRONA AND LOS ANGELES, CALIFORNIA; HENDERSON, NEVADA; SAN ANTONIO, TEXAS
(AMERICAN LITHIUM CHEMICALS, INCORPORATED AND SAN ANTONIO CHEMICALS, INCORPORATED)

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Producers of: **BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES PERCHLORATES • MANGANESE DIOXIDE** *and other diversified chemicals for Industry and Agriculture*

Equipment News . . .

Thermo-Panel Coils

Price Data Bulletin No. 259 is the name of a new bulletin published by Dean Thermo-Panel Coil Division of Dean Products, Inc. The bulletin describes the Thermo-Panel Coil which takes the place of pipe coils.

The bulletin shows valuable improvements over former designs which make possible a decisive increase in capacity of the product; Thermo-Panel is made of a wide variety of metals.

For your copy, circle Number 1 on CF's Information Service Card, page 59.

Attrition Mills Data

A data sheet giving information and specifications on attrition mills is being offered by the Munson Mill Machinery Company.

The ball bearing attrition mills are designed for the reduction of friable materials (which include fertilizer) and non-friable materials.

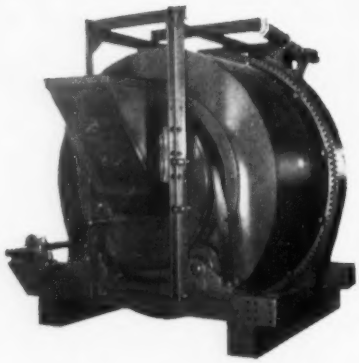
The two basic types of mills outlined on the data sheet are Double Disc and Single Disc Mills. Complete specifications are offered as to construction and performance.

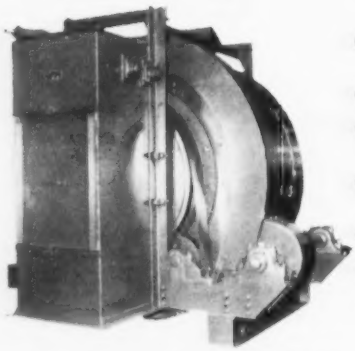
A copy of the data sheet may be obtained by circling Number 2 on CF's Information Service Card, page 59.

Quality . . . by Atlanta Utility

BATCH MIXERS

- "Straight-Through" Nitrogen Solution Distributor Supported at Both Ends
- Additional Distributor For Acid May Be Added
- Steep, Large Intake Chute
- Large Intake Chute Door
- Packed Seals At Intake & Discharge Ends of Drum





- Discharge Mechanism Air Or Manually Operated
- Large Mixer Drum Door
- Steel Housed Discharge With Vent Opening, Large Door
- Heavy Duty Roller Bearing Pinion Shaft Bearings
- Rugged Heavy Base
- Independently Adjustable Trunnion Wheels on Heavy Duty Ball Bearings

ROTARY DRUM BATCH MIXER SIZES:

½ Ton No. 112-F 5400 lb
1 Ton No. 186-F 8800 lb
1½ Ton No. 187-F 10,000 lb
2 Ton No. 188-F 13,000 lb

CONTINUOUS AMMONIATORS—GRANULATORS—BATCH MIXERS
PULVERIZERS — CAGE MILLS — BELT CONVEYORS
BAGGED GOODS CONVEYORS — REVOLVING & VIBRATING SCREENS
COMPLETE MIXING UNITS — SHIPPING UNITS
MATERIALS ASSEMBLY HOPPER UNITS — HOPPER SCALES
BROADFIELD CONTINUOUS SUPERPHOSPHATE UNITS

ATLANTA UTILITY WORKS
EAST POINT, GEORGIA
Manufacturers and Engineers for 61 Years

Lawn Spray Device

A new jet operated lawn sprayer invention that attaches to rotary mowers takes all the work out of applying fertilizers, weed killers, and insecticides to home lawns, according to the manufacturer.

Called The Dietz Spray-Mow, the new device consists of a flexible, plastic bag that is attached to the mower handle. A vinyl tube runs from the bag to two clog-proof jets which are attached to the under side of the mower blade housing. Liquid coming out of the two jets is atomized by the mower blades and sprayed on the lawn. The mower housing confines the spray to the path of the mower as the lawn is cut.

According to the R. E. Dietz Co., who is marketing the new device, it will eliminate an extra gadget in the garage or tool house, since it occupies no more space than the mower would without the Spray-Mow attachment. It will sell for $8.95. Full data can be obtained by circling Number 3 on CF's Information Service Card, page 59.

"Cropmaster" Autogiro Booklet

Details of the new Kellett Cropmaster autogiro are revealed in a new booklet just issued by the Kellett Aircraft Corp.

Embodying the simplest rotating wing design, Kellett's autogiro is presented as the most advanced aircraft for agricultural work, the near-helicopter performance of the Cropmaster will be demonstrated publicly for the first time this Spring.

Copies of the booklet may be obtained by circling Number 4 on CF's Information Service Card, page 59.

Screening Bulletin

Important information that will help plant and chemical engineers, as well as purchasing agents to properly specify sieves for sifting equipment is included in the new bulletin being offered by Sprout, Waldron & Co.

Entitled "The Right Way To Specify Sieves," Bulletin I-42 consists of a technical article explaining the specification methods step by step, and including a comparison of Tyler and U. S. Standard series sieves, and covering a variety of other important factors in sieve selection. Copies available by circling Number 5 on CF's Information Service Card, page 59.

SUPPLIERS TELL US ABOUT EQUIPMENT

Liquid Applicator

The Series "800" Chemi-Spredder is a new unit offered by the John Blue Co.

Extensive research efforts and interviews with liquid fertilizer and nitrogen solution dealers preceded building of the new machine.

With the Series "800", up to 20 acres or more an hour can be covered at rates in excess of 60 gallons per acre on a 28-foot swath and more than 80 gallons per acre on the 21-foot swath. The machine comes with a choice of heavy gauge aluminum or steel tanks with capacities up to 300 gallons.

Special features of the Series "800" Chemi-Spredder include: kickstand to prevent machine from turning over; four-way folding boom; accurate, dependable "LF" pump for metering all liquid fertilizers; rugged structural steel frame, cold formed and welded for maximum strength; sturdy, wide tank supports; tongue jack; 26-inch clearance for use in row crops; 80-inch tread; boom folds forward for compact transport; heavy duty 15-inch Timken bearing wheels; compact tongue design for short turning and maneuverability; clean, uncluttered lines; heavy duty hitch.

Full data can be obtained by circling Number 6 on CF's Information Service Card, page 59.

Syncro-Matic Separator

A new 2-page illustrated bulletin describing their Syncro-Matic Separator with TDM Control has been issued by the De Laval Separator Company.

The Syncro-Matic is a vibrating screen separator with controlled three dimensional motion—horizontal, vertical and gyratory.

The two-color bulletin features pictures of the machine, specifications and blueprint diagrams.

Copies of the bulletin (SA 1101-12-58) can be obtained by circling Number 7 on CF's Information Service Card, page 59.

Oscillating Conveyors

A new four-page Brochure VB-95 covers types of vibrating equipment manufactured by Prab Conveyors, Inc., and includes capacity chart, photos, and new and improved operational features.

"Vibra-Power" oscillating conveyors can handle multiple types of material. Normal widths of conveyors are from 6 to 36 inches and are manufactured from 10 gauge, 3/16" and ¼" steel plate. For special requirements, troughs can also be supplied in alloy metals such as stainless steel and nickel clad.

These Oscillating Conveyors can also be equipped with dust-tite covers, dividers, intermediate discharge and receiving gates, coolers, heaters, and other special processing features.

For your copy, circle Number 8 on CF's Information Service Card, page 59.

Let Our

Information Service Bureau

get detailed literature for you about

- *NEW PRODUCTS*
- *NEW MATERIALS*
- *NEW PROCESSES*
- *NEW SPECIFICATIONS*

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TEAR OFF ALONG DOTTED LINE

6-59

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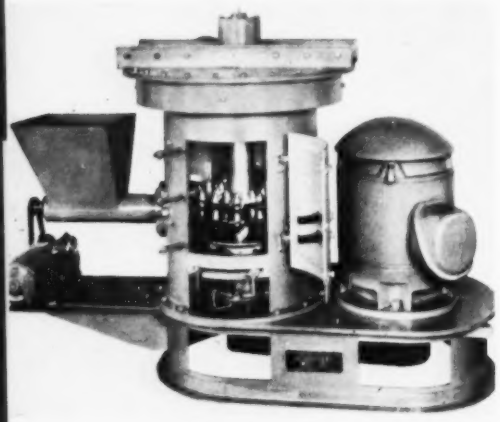
Equipment News . . .



New Sturtevant Mill

A vertical hammer mill, with an integral air classifier for the extremely fine grinding of soft, nonmetallic materials in capacities of up to 5000 lbs. of material an hour, has been introduced by Sturtevant Mill Company. Called Sturtevant Pulver-Mill, the unit offers Sturtevant-designed double-hammer grinding combined with unique deflector wall construction. As the rigid revolving hammers crush the material between stationary wall hammers, the special deflector wall "bounces" insufficiently ground material back into the grinding zone. Pulverized fines are pulled upward through the revolving centrifugal selector arms by a whirlwind exhaust fan. Only particles of desired fineness are blown to the collector.

The Pulver-Mill incorporates the "open-door" design feature of all Sturtevant dry processing machinery, which allows instant accessibility to all moving parts for cleaning, inspection or maintenance.

Full data is available by circling Number 9 on CF's Information Service Card, page 59.

Lift Truck Brochure

Material handling engineers will be interested in the technical brochure 'Walkie or Rider Trucks,' published by Automatic Transportation Company.

This brochure gives the pros and cons for both the walkie and rider-type industrial trucks and how they are used in industry. Advantages and applications for both types of trucks are outlined, along with a convenient check list giving facts to consider when analyzing truck requirements.

Illustrations show how both the walkie and rider-type trucks fit into a wide variety of material handling programs. This 8-page, two-color brochure contains useful information which will assist in selecting the correct industrial truck to fit individual job applications.

The brochure is available by circling Number 10 on CF's Information Service Card, page 59.

Vibrating Screens Book

The largest selection of vibrating screens in the world, 12 different types in 212 sizes, is now available to industry from Link-Belt Company, according to "Vibrating Screens", a new 48-page book (No. 2777) which also contains information on screen cloths and accessories.

The new book describes and illustrates each of the screens as they are used to meet screening and shakeout needs of practically every industry. Complete tables of materials, selection data, easy-to-read drawings and cut-away photographs showing construction features are also given.

The new book also contains information on accessory items including screen cloth recommendations, data on bouncing ball decks, snubbing and plugging controls, repulping decks and electrically heated screen cloths.

A copy of Book 2777, "Vibrating Screens," can be obtained without charge by circling Number 11 on CF's Information Service Card, page 59.

Lime and Fertilizer Spreader

New literature on the New Leader L-32S Engine-Driven Combination Lime and Fertilizer Spreader is being made available by the Highway Equipment Company.

Developed to meet precise per-acre requirements, the L-32S spreads evenly and uniformly to both sides, as well as behind the rig, through the action of engine-driven twin spinners which maintain constant speeds as regulated by the driver.

A sister model, the L-22S, has the same general specifications as the heavy-duty L-32S except it has a smaller engine, making it more suitable for lighter applications. Complete details concerning both spreaders can be obtained by circling Number 12 on CF's Information Service Card, page 59.

PVC Valves, Diaphragms

A new line of valve trim and diaphragm protectors called the Chem-Line has been announced by J. E. Lonergan Co.

Chief feature of the new line is the use of the plastic polyvinyl chloride (PVC) for all normally wetted parts. Other parts are of normal materials. In the case of valves, the guide and disc holder and in some instances, the housing, may also be made of PVC. In the case of the protectors, the diaphragm retaining ring and the bottom bowl are supplied in PVC.

The new Chem-Line is being furnished on a special application basis to fertilizer plants, and other processing plants.

Further information and details may be obtained by circling Number 13 on CF's Information Service Card, page 59.

Shaft-Mounted Speed Reducers

Lima Shaft-Mounted Speed Reducers, a recent addition to their line of gearmotors and gear reducers, have been announced by Lima Electric Motor Co. Designed for quick, easy installation to the driven shaft and require a minimum amount of mounting space, all Lima shaft-mounted speed reducers use standard V belts and pulleys and are equipped with a torque arm, which permits easy, infinite belt adjustments.

Each Lima unit may be operated over a wide range of speeds by using a variable pitch pulley, or by changing sheave combinations. Available in single and double reduction units, Lima offers optional built-in backstop which prevents reverse rotation. An optional overload Release Torque Arm is also available to furnish automatic overload protection.

Capacities range from 1 to 40 HP with single reduction gearing, with output speeds from 90 to 420 RPM; double reduction units from 1 to 30

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Commercial Fertilizer and Plant Food Industry
75 Third Street, N. W.
Atlanta 8, Georgia

Equipment News . . .

HP, with speed ranges from 10 to 160 RPM. Flange mounted type with double reduction gearing is also available with capacities from 1 thru 7 HP and speed range from 10 to 135 RPM.

For complete information circle Number 14 on CF's Information Service Card, page 59.

Gear & Fluid Drive Book

Information on the most extensive line of standardized gearmotors, motogears and fluid drives available to industry has been combined into one new 48-page book now available from Link-Belt Company.

Book 2747, "Gearmotors, Motogears and Fluid Drives" describes the functions of these various types of drives and provides detailed selection data, dimensions, overhung load ratings and mountings. It also lists such accessories as couplings, backstops and slide rails.

Detailed engineering and selection data, with service classifications and application information, is contained in Book 2747. A copy can be had free by circling Number 15 on CF's Information Service Card, page 59.

Services News . . . . . .

Chemical Testing Services

United States Testing Company's 4-page Bulletin 5901 describes the company's complete line of chemical laboratory testing and research facilities.

Also described in Bulletin 5901 is the company's recently announced Standards Inspection Service, a facility for providing individually inspected and calibrated laboratory apparatus and glassware.

Bulletin 5901 is available free on request; just circle Number 16 on CF's Information Service Card, page 59.

Materials News . . . . .

Protective Hand Creams

Three new creams that provide protection against virtually any skin irritant commonly encountered in industry have been developed by Mine Safety Appliances Company.

The new creams, called 'M-S-A Fend," are now available in three special-purpose formulas.

All three cream formulas contain hexachlorophene for bacteriological and anti-fungus effects, as an exclusive deodorant. They can be removed easily in mild soap and water. An emollient feature prevents drying, cracking, or chipping.

Bulletin 0403-4 is available by circling Number 17 on CF's Information Service Card, page 59.

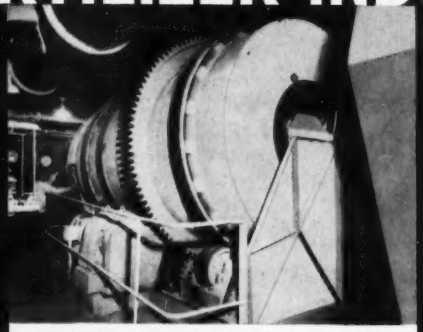
Anti-Caking Agent

Producers of fertilizers and other hygroscopic or sticky chemicals will be interested in 'Attacote,' a new fine particle size, scrptive clay product specifically produced by Minerals & Chemicals Corporation of America as an anti-caking agent. Field tests in the form of actual commercial applications during the past year indicate that the material is superior to many agents currently used for coating prilled, granular and explosives grade ammonium nitrate; ammonium sulfate; agricultural grades of urea; granular high analysis fertilizers; and such resins as phenol-formaldehyde.

A magnesium aluminum silicate, Attacote is inert and non-toxic. Its low bulk density gives it high covering power and it has superior adherence properties. Its excellent desiccant properties, which stem from its needle-like particle structure and resulting large surface area, are credited with making it more effective than conventional coating agents. Further information may be obtained by circling Number 18 on CF's Information Service Card, page 59.

AMMONIATORS*
COOLERS
DRYERS
ELEVATORS
GRANULATORS*
CONVEYORS

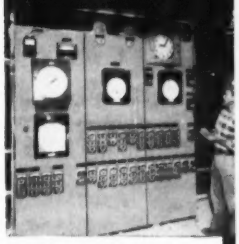
FOR THE
FERTILIZER INDUSTRY



*TVA Licensed Manufacturer

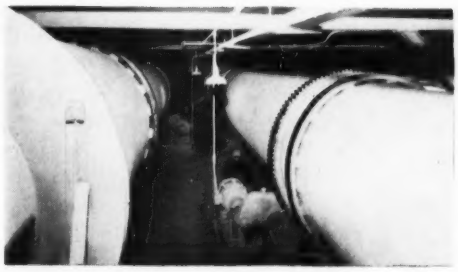
RENNEBURG

7'6" dia. x 15' heavy duty Continuous Combination Ammoniator-Granulator—With 40 HP motor and Renneburg exclusive motorized cam-actuated knockers. Unit handles 70 tons per hour granular fertilizer throughput.



INSTRUMENT PANEL

"Nerve center" of this large Renneburg designed and equipped chemical fertilizer plant. Includes furnace pyrometer; temperature indicating, recording and controlling potentiometers; load indicating ammeter, and start-stop push button stations with signal lights for each machine. Audio-howlers warn operators of possible processing difficulties.



TWO RENNEBURG Heavy-Duty Rotary Units

Each 8' diameter x 50', with 50 HP fluid drives . . . for drying and cooling high analysis chemical fertilizers.

Literature and information on request.

EDW. RENNEBURG & SONS CO.

2639 Boston Street, Baltimore 24, Md.

Pioneers in the Manufacture and Development of Processing Equipment for over 85 years.

Sackett Equipment PAYS ITS OWN WAY

Sackett Builds The Equipment You Need

- **Continuous Granulating Units**
- **Plant Modernization Programs**
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Aerating Equipment
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Basing Units
Belt Conveyors
Bucket Elevators
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Continuous Acidulating Processes
Continuous Ammoniating Systems
Conveyors
Coolers
Crushers
Disintegrators
Dry-Mixing Units
Dust-Arresting Equipment
Fume Scrubbing Systems
Hoppers and Spouts
Materials Handling Equipment
Milling and Screening Units
Multiple Hopper Batching Systems
Oil Fired Dryers
Plant Mechanization Systems
Pneumatically-Operated Gravity Batch Mixers
Pneumatically-Controlled Valves
Pulverizers
Sackett Timken Bearings
Sacking Units
Scales
Screens
Shipping Units
Shuttle Belt Conveying Systems
Tailing Mills
Vacuum Condensing Systems

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IM&C Seminar Features Experts

Nineteen agricultural research experts from twelve major colleges participated in a recent soils research seminar at International Minerals & Chemical Corporation to discuss and present reports on projects involving magnesium and potassium in plant growth.

The conference at IMC headquarters in Skokie, Ill., Chicago suburb, was sponsored jointly by the company's Potash Division and the research department of the Research, Engineering, and Development Division to provide an opportunity for ready exchange of information between participants, both visitors and IMC representatives. The company's Potash Division allots approximately $50,000 annually for grants-in-aid on magnesium and potassium research projects in major colleges as part of IMC's overall grants-in-aid program.

University men reporting or in attendance, were:

Dr. J. F. Davis, professor of soil science, and L. N. Shepherd, department of soil science, Michigan State; Dr. Ora Smith, director of research, Potato Chip Institute, Cornell University; Dr. Fred Adams, associate soil chemist, and Dr. H. T. Rogers, head, agronomy and soils, Auburn; Dr. K. C. Berger, professor of soils, Wisconsin; Dr. J. D. Lancaster, agronomist, Dr. Lyle E. Nelson, associate agronomist, Mississippi State; Dr. A. L. Kenworthy and Dr. R. L. Carolus, both professors of horticulture, Michigan State University;

Dr. S. A. Barber, and Dr. Russell Stivers, associate professors of agronomy, Purdue; Dr. H. W. Gausman, associate professor of agronomy, and Dr. R. A. Struchtemeyer, head, department of agronomy, Maine; Dr. D. A. Brown, associate agronomist, Arkansas;

Dr. G. E. Smith, professor of soils, Missouri; Dr. H. J. Reitz, horticulturist in charge, Florida Citrus Experiment Station; Dr. J. W. Fitts, head, department of soils, North Carolina State; and Dr. N. F. Childers, head, horticulture department, Rutgers.

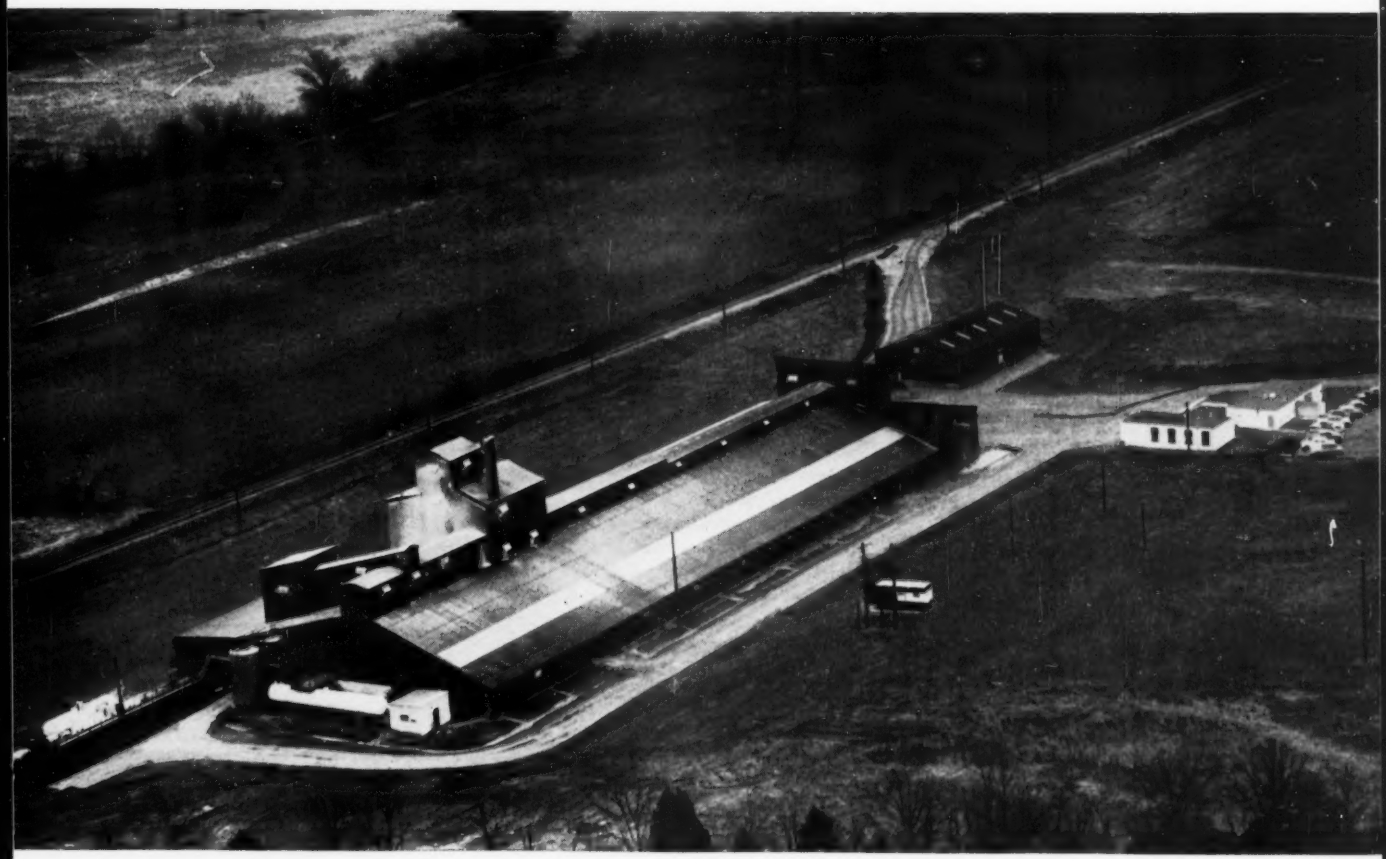
NPFI Sets Up Shrinkage Study

To help determine whether fertilizer in-plant general inventory shrinkage can be deferred and controlled, National Plant Food Institute has set up an In-Plant Shrinkage Committee, which held its first meeting recently, to study the subject.

Serving on the committee are Charles Harding, Virginia-Carolina Chemical Corp.; Dale C. Keiffer, Smith-Douglass Co., Inc.; J. E. Reynolds, Davison Chemical Co., Division of W. R. Grace & Co.; M. D. Sanders, Swift & Co.; Rodger C. Smith, Eastern States Farmers Exchange, Inc.; Albert Spillman, Fertilizer Manufacturing Cooperative, Inc., and Vincent Sauchelli, National Plant Food Institute.

Industry Meeting Calendar

DATE	EVENT	LOCATION	CITY
June 9-10	Southern Fert. Control Officials	Velda Rose Motel	Hot Springs, Ark.
June 9-11	Fert. Technology Demonstration	Muscle Shoals Labs	Sheffield, Ala.
June 14-17	National Plant Food Institute	Greenbrier Hotel	Wh. Sul. Sprgs., W. Va.
June 29-30	California Fertilizer Conference	University of California	Tacoma, Wash.
July 7-9	Pacific N.W. Fert. Conference	Winthrop Hotel	Davis, Calif.
June 27	Del-Mar-Va Fertilizer Assn.	Geo. Washington Hotel	Ocean City, Md.
July 15-17	Southwest Fertilizer Conference	Galvez Hotel	Galveston, Tex.
Aug. 18-22	Canadian Fertilizer Assn.	Bigwin Inn	Lake of Bays, Ont.
Sept. 24-25	Northeastern Fertilizer Conference	Biltmore Hotel	New York City
Sept. 30-Oct. 1	Southeastern Fertilizer Conference	Biltmore Hotel	Atlanta, Ga.
Oct. 14-16	Pacific N.W. Fertilizer Convention	Chinook Hotel	Yakima, Wash.
Oct. 15	Chemical Control Conference	Shoreham Hotel	Washington, D. C.
Oct. 15-16	Fertilizer Control Officials	Shoreham Hotel	Washington, D. C.
Oct. 19-20	Fertilizer Safety Section	LaSalle	Chicago, Ill.
Nov. 4-6	Fertilizer Industry Round Table	Mayflower Hotel	Washington, D. C.
Nov. 8-10	Nat'l. Fertilizer Solutions Assn.	Statler Hilton	St. Louis, Mo.
Nov. 9-11	California Fertilizer Association	Fairmont Hotel	San Francisco, Calif.



A NEW PLANT FOR KENTUCKY . . . A NEW RECORD FOR SACKETT

Here's a brand new granular plant for Kentucky . . . and a remarkable new construction record for The Sackett Company.

Recently completed at Russellville for Cooperative Fertilizer Service of Richmond, this big and fully automated fertilizer manufacturing facility* was built by us in 6 short months.

This is the kind of field performance that Boards of Directors and top management people are looking for . . . the kind they are finding in Sackett . . . *and at the right price, too!*

*Including offices, service buildings and rail sidings

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- COMMERCIAL FERTILIZER PLANTS
- SUPERPHOSPHATE PLANTS
- RELATED PRODUCTION EQUIPMENT

PEOPLE in the Industry

Harding

Cox

Virginia-Carolina

Once foreman of one of its fertilizer plants, Charles T. Harding is now executive vice-president of Virginia-Carolina Chemical. It was only last March that he became an officer of V-C, being then elected vice-president. He joined V-C in 1918.

Curtis A. Cox was named manager of the manufacturing department and Frank C. Richter Jr. was appointed chief engineer. Mr. Harding made both appointments.

Olin Mathieson

Olin Mathieson Chemical Corporation announced a realignment of its Insecticide Products department:

K. B. Nash and A. E. Collazo were appointed assistant managers. Both will report directly to G. D. Baerman, manager of the department. The move also sends E. G. Hartzfeld to Dallas, Texas, as sales representative for the Southwest.

H. O. Manning becomes manager, customer service, replacing D. M. Malcolm, who has transferred to the Nitrogen products department.

Merck

Donald G. Smith has joined Merck and Co., Inc,. chemical division, as sales representative for plant products, it was announced May 8 by R. W. Hayes, Merck marketing director for general products. Mr. Smith will work out of Lubbock in a territory extending through parts of Texas, New Mexico, Louisiana and Mississippi.

Mr. Smith comes to Merck with a background of 11 years in all phases of practical farming methods and scientific techniques in agriculture. He has operated and managed a 1,000-acre irrigated cotton and grain farm in Texas, and has served in commercial cotton trade channels as buyer and salesman.

U of Arkansas

C. A. Vines has been promoted to director of Agricultural Extension Service, University of Arkansas, effective July 1. He is vice-chairman of the Southern Extension Directors, and was Progressive Farmer's "Man of the Year" in 1954.

Wilson & Geo. Meyer & Co.

Jeffery W. Meyer became president of Wilson & Geo. Meyer & Co. on May 1. Wilson Meyer, who has been president since 1928, became chairman of the board of the 109-year-old firm.

Jeffery Meyer first joined the company in 1948. He is the third generation in this company. Previously his grandfather George H. C. Meyer was also head of the firm.

Wilson & Geo. Meyer & Co. is the direct descendant of the enterprise founded in San Francisco in 1850 by William Meyer, great-uncle of Wilson Meyer, who was a member of the 1851 Vigilance Committee and treasurer of the 1856 Vigilance Committee.

Among the companies whose products it distributes are Eastman Chemical Products, Inc., chemicals and plastics; Stauffer Chemical Co. and Western Phosphates, Inc., agricultural phosphates; Norsk Hydro of Norway, Norwegian calcium nitrate and urea, and Semet-Solvay coke.

The firm's headquarters are located in San Francisco with district offices in Los Angeles, Portland, Seattle, Salt Lake City and sales offices in Phoenix, El Centro, Fresno, Twin Falls, Denver and Yakima.

Monsanto

S. R. Clement, formerly director of sales — agricultural chemicals for Monsanto Chemical Company's Inorganic Chemicals Division, has been appointed to the newly created position of director of sales in charge of customer relations, J. L. Christian, a Monsanto vice president and division general manager announced. Mr. Clement's headquarters will remain in St. Louis.

At the same time J. E. Crawford Jr., director of marketing for the division, announced promotions of three St. Louis members of the marketing group as a result of the Clement appointment. Dr. P. G. Arvan, formerly director of sales, technical service, replaces Mr. Clement, and Dr. Louis Fernandez, formerly product sales manager—phosphates, takes Dr. Arvan's place. A. Q. Svoboda, formerly supervisor — industrial phosphates, has been named to succeed Dr. Fernandez.

Davison Chemical

Appointment of George Klein as sales manager, triple superphosphate, is announced by D. N. Hauseman, vice president, agricultural chemicals, W. R. Grace & Co. Davison Chemical division.

Klein

Mr. Klein, who has been 24 years with Davison in various posts, has recently been on special sales assignments. In his new position he reports to William Caspari, Jr., general sales manager, agricultural chemicals.

A native of Baltimore, Mr. Klein has had wide experience in mixed fertilizers as well as fertilizer materials. He was from 1944 to 1954 manager of the Davison mixed fertilizer plant at Nashville. From 1954 to 1956, he was general sales manager, mixed fertilizer division.

Ketona

Jack D. Hayes has been elected vice president of Ketona Chemical Corporation, it was announced by P. H. Neal, president of Ketona, which is owned by Hercules and Alabama By-Products Corporation.

Alto J. Smith and Mr. Hayes have been named to the Ketona board of directors to succeed J. M. Martin and John E. Goodman, who have resigned. Mr. Hayes' election as vice president fills a vacancy left by the resignation of E. St. Pierre Bellinger.

Other members of the Ketona Board are: Mr. Neal, J. E. Johnson, F. G. Koenig, Jr., and R. A. Fulwiler, Jr.

U of California

Dr. P. R. Stout has become chairman of the Department of Soils and Plant Nutrition, University of California, succeeding Dr. Daniel B. Aldrich, who held the post until his appointment to the position of Dean of the College of Agriculture. The Department has moved into its new home. A new state-wide office building will shortly be ready on the Berkeley campus, and Dr. Aldrich will then make his headquarters there.

Corbin

Hallinan

Cannon

Harvey

Bagwell

Gemmell

Lummus

The Lummus Company announces the election of C. Frank Corbin as comptroller and Richard J. Hallinan as secretary of the firm.

Mr. Corbin joined Lummus in 1955. He is a New York Certified Public Accountant.

Mr. Hallinan joined Lummus in 1958 as Counsel.

Jeffrey

The industrial division of The Jeffrey Manufacturing Company, Columbus, Ohio, has realigned its field office operations with the appointment of four regional sales managers, five district managers, and the assignment of sales personnel to several of the company's branches, it has been announced by C. G. Hawley, general manager of sales, industrial division.

William K. Myers, formerly New York District Manager, has been named Eastern regional sales manager. Replacing him as manager of the New York office is Paul Lawall. William Cheney has been promoted to district manager, Boston.

East Central regional sales manager is Howard S. Davies. Paul Hendry replaces Mr. Davies as manager of the Pittsburgh office. Dean Diehl will be transferred to the Columbus, Ohio, district office.

Elmer F. Longnecker becomes Central regional sales manager. Promoted to district manager, Detroit, is William W. Etchberger.

The Duluth territory will be under the jurisdiction of the Milwaukee office as Carl C. Verhine, formerly at Duluth, joins the Chicago office as a sales engineer. Chicago has also added David J. Shanahan to its staff.

The appointment of Vernon L. Ekblad as Southern regional sales manager completes the list of new regional assignments. Replacing Mr. Ekblad is Charles E. Lawall. Other personnel changes in the South include the assignment of James C. Elliott to the Raleigh, North Carolina branch. Thomas R. Bodden will serve in the Mobile territory.

Owens-Illinois

Frank Cannon has been named Eastern regional sales manager of the Owens-Illinois multiwall bag division, succeeding George S. Harvey, Sr., has requested that his duties be restricted to the New England area for personal and family reasons.

During 33 years' experience in the multiwall bag business, Mr. Harvey's name has become familiar to industrial packagers throughout the eastern part of the country.

Mr. Cannon, with 10 years' experience in selling multiwall bags, was Philadelphia sales representative at the time of his appointment.

Federal Chemical

Victor C. Hemeier has been named assistant division sales manager of Federal Chemical Company at its Butler, Indiana plant. Mr. Hemeier has been associated with the fertilizer industry in Indiana for ten years.

In his newly created position he will assist Floy L. Lucas, div. sales mgr. at Butler.

Gandy

The appointment of Harry R. Colvin to the position of director of field sales for the Gandy Company, Owatonna, Minnesota, was recently announced by E. S. Gandrud, president.

In his new position, Mr. Colvin will assist in the formation and growth of the Gandy Sales organization and the promotion of the Gandy line of commercial fertilizer applicators and granular chemical applicating equipment. He will travel the United States and Canada.

Simplicity Engineering

The appointment of Robert J. Ehrhart to the sales engineering staff of Simplicity Engineering Company, Durand, Michigan, has been announced by sales manager, Ralph C. Johnson. After a training period in the Simplicity home office, Mr. Ehrhart will be assigned to the Philadelphia-Baltimore area.

Bradley & Baker

Bradley & Baker's Atlanta, Ga., office is now represented in central and northern Georgia by Charles B. Bagwell, Jr. C. L. "Jack" Gemmell is sales representative in northeastern South Carolina.

Hooker

A number of organizational changes have been effected in the phosphorus division of Hooker Chemical Corporation since it was placed on an autonomous basis by Hooker on April 1 with F. Leonard Bryant as general manager. Division headquarters is at Jeffersonville, Ind. Division plants are located at Jeffersonville, Columbia, Tenn., Adams, Mass., and Dallas, Texas.

The division's sales organization under John B. Sutliffe, division sales manager, is realigned into three sections. Robert B. Boyd becomes manager, industrial sales; W. Newell Wyatt is named manager, sales administration; and Harold E. Frederick, continues as manager, agricultural sales.

Newly reporting to Mr. Boyd will be sales representatives James T. Whelen, who remains at New York City, and Robert C. Jackson who will work from the Chicago office. Now reporting to Mr. Frederick will be William J. Barrett, sales representative, and Erroll F. Cook, technical specialist.

Joseph M. Pyle Jr. has joined the company as industrial relations manager for the division. A. Robert McNamara has been appointed works manager of the Adams, Mass., plant. Transferring to Adams is John D. Parkes, who now becomes plant engineer, reporting to Mr. McNamara.

Ohio AES

D. J. Hoff, agronomist at the Ohio Agricultural Experiment Station, Wooster, will be the state's first technical advisor to India on soil problems when he leaves this month for Rajasthan College of agriculture.

Hubbard-Hall

The Hubbard-Hall Chemical Company has announced the appointment of Raymond P. Atherton, Litchfield County agricultural agent, to the staff of Hubbard-Hall's agricultural division as agricultural economist, effective July 1, 1959. Mr. Atherton, one of the most outstanding County Agents in New England, is widely known to Northeastern farmers and agricultural leaders.

Atherton

During his 33 years of extension work, Mr. Atherton has received both regional and national recognition as an agricultural leader. He received the Distinguished Service Certificate from the National County Agents' Association in 1939. In 1951 he received a certificate of commendation for activity in "Promoting Greener Pastures." He is a past President of the New England County Agricultural Agents' Association.

Raymond Bag

Craig E. Davis has been appointed project engineer for Raymond Bag Corporation, according to an announcement by J. R. Clements, President.

Davis

Mr. Davis was previously a project manager for Ketco, Inc. Before that he was assistant chief engineer of the Black-Clauson Company at Hamilton, Ohio. He is a graduate of Purdue University with a degree in electrical engineering, and a member of the American Institute of Electrical Engineers.

Union Special

The appointment of Durwood I. McFarland as Junior representative of the Dallas district office, effective immediately, has been announced recently by Union Special Machine Company. Mr. McFarland will work directly under Terrie Biggers covering the western Missouri, southern Nebraska, and Kansas territory.

McFarland

Mr. McFarland has had 13 years experience in the sewing industry, starting with the Elder Manufacturing Company of Webb City, Missouri, in 1946. From there he joined Smith Bros. Manufacturing Company in 1952 and worked for them until he joined Union Special in 1959.

Bemis

Bemis Bro. Bag Company announced the appointment of W. H. Dillon as sales manager of the company's Minneapolis Sales Division effective immediately. Mr. Dillon had been serving as plant merchandiser at the company's Houston bag factory during the past three years.

Dillon

Mr. Dillon will be responsible for management of sales in a territory which includes Wisconsin, Minnesota, North Dakota and portions of South Dakota, Iowa, and Michigan.

Dig Deep and Pray!

One Rev. Franklin Loehr has written a book, and conservative Doubleday has published it, priced at $3.50, which reveals 900 experiments over a 5-year period by 150 members of Rev. Loehr's prayer group on the effect of prayer in making things grow bigger and better. All types of prayer were tried, according to the book, and were effective, especially those addressed directly to the plants or seeds. But it seems that "buddying" up to the plants, and addressing them "on their own level of consciousness" was best of all.

Spread Safety Outside The Plant

A safety man has come up with a sure-fire suggestion on how industry can save itself a lot of money each year.

"Extend your safety know-how and resources beyond the factory gate," advised Harry C. Johnson, staff representative of the National Safety Council's off-the-job safety committee. "Keep your workers as safe off the job as you do on."

"A worker injured off the job," he points out, "is just as absent from work as one who has been hurt at his machine."

—CHANGES—

Chemore Corporation

Chemore Corporation, general representative in the United States and Canada for Montecatini, announces the removal of its offices to new and larger quarters at 2 Broadway, New York 4, N. Y. The telephone number has been changed to BOwling Green 9-5080.

Highway Equipment

Heil Equipment Company of Boston, Brighton, Massachusetts, is a new distributor for Highway Equipment Company, Cedar Rapids, Iowa. They will sell and service New Leader lime spreaders, combination lime and fertilizer spreaders, widespread lime and fertilizer spreaders and mobile blenders.

Heil will serve the states of Maine, New Hampshire, Rhode Island and Eastern Massachusetts. Address of the new distributor is 164 Market Street, Brighton, Massachusetts.

Richardson Scale

Richardson Scale Company has moved its Philadelphia regional office to 11 Park Road, Havertown, Pa., effective immediately. The office handles all the company's business in Pennsylvania, Virginia, Maryland, and Delaware. Mailing address of the new office is P. O. Box 602. The telephone number remains unchanged from HIlltop 6-1308. At the same time, the company announced the addition of Alan Farnham to the Philadelphia office staff. Headquarters of the firm is in Clifton, N. J.

Peter C. Allen, president of Canadian Industries Limited, inspects bagging operations at the company's Halifax, N.S. fertilizer plant. Mr. Allen's recent trip to Halifax was part of a cross-Canada tour of C-I-L plant and office locations which took him from St. John's, Newfoundland, to Victoria, B.C. Others in the photo (l to r) are operators Harry Snyder and Paul Roy and Plant Foreman John Cree.

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TABLE OF CONTENTS

Agricultural Importance of Ammonia 2
Manufacture of Ammonia and Nitrogen Solutions 4
Specifications of TEXACO's Aqua Ammonia, Anhydrous Ammonia and Nitrogen Solutions 6
Industrial Uses of Ammonia 8
Agricultural Uses of Ammonia and Nitrogen Solutions 10
Mixed Fertilizer Manufacturing Processes 11
Comparison of Pug-Mill and Granulating Drum Processes 12
Factors Affecting Granulation 13
Choosing Fertilizer Ingredients 13
Selecting Fertilizer Solutions 14
Ammoniation Rates 15
Recycle Rates 15
Moisture Control 16
Temperature Control 16
Cooling 16
Screening 17
Alternate Ingredients 17
Sample Formulation Calculations 18
Liquid Mixed Fertilizers 21
Safety
Handling Anhydrous Ammonia and Nitrogen Solutions 22
Plant Safety Precautions 23
First Aid 24
Tables and Charts
TEXACO Anhydrous and Aqua Ammonia Sales Specifications 6
Specifications of TEXACO Nitrogen Solutions for Fertilizer Manufacture 7
Comparative Advantages: Pug-Mill vs Granulating Drum Mixer 12
Hygroscopicity and Solubility of Common Fertilizer Materials 17
Amounts of Nitrogen in Various Nitrogen Fertilizers 20
Specific Gravity of TEXACO Nitrogen Solutions and Aqua Ammonia at Various Temperatures 25
Vapor Pressure of TEXACO Nitrogen Solutions at Various Temperatures 26
Vapor Pressure of TEXACO Anhydrous and Aqua Ammonia at Various Temperatures 27
Properties of Diluted TEXACO Nitrogen Solutions 28-33
Effect of Loss of Ammonia from TEXACO Nitrogen Solutions 33
Specific Gravity of Aqua Ammonia at Various Temperatures 34
Vapor Pressure of Anhydrous Ammonia at Various Temperatures 35
Vapor Pressure of Aqua Ammonia at Various Temperatures 36
Freezing Point-Composition of Ammonia-Water Systems 36
Specific Volume and Density of Anhydrous Ammonia at Various Temperatures 37
Sulfuric Acid Data 38
Phosphoric Acid Data 39
Two-Way Temperature Convertion Scale 40

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Soil-Testing Project in Michigan Launched With Kick-Off Dinner

Active support by the Michigan fertilizer industry can help speed the success of the forthcoming Ionia County intensified soil testing and fertility program, County Agent Fred Peabody has reported.

The project was launched with a kick-off dinner for county Extension leaders, bankers, merchants and civic organization representatives, May 28 at Ionia, Mich. Speakers outlined the program's objectives and its benefits to farmers and the entire community.

The project, sponsored jointly by the Michigan Agricultural Extension Service and the National Plant Food Institute, designed to get every Ionia County farmer to test his soil, cut costs of production and increase his profits in 1959 and the years ahead.

John R. Guttay, district representative of the Institute, is cooperating with Mr. Peabody in setting up the follow-through on the program. The Institute has prepared two color posters and other special educational material including the new Michigan Yield Goal wall charts and check lists to help promote the project. Local newspapers and radio stations have pledged full support.

A number of soil sample depots have already been established and others will be added.

Beginning June 4, a series of monthly dinner meetings is slated for fertilizer dealers and salesmen, Mr. Peabody reports. These sessions will inform salesmen and dealers about the program's progress, seek their advice and suggestions about promotional activities, and help them understand soil test reports and fertilizer recommendations.

At each meeting, Mr. Peabody and his associates will discuss and explain the management practices for crops immediately ahead on the schedule. Top dressing established hay fields is the first project following soil tests. This will be followed by information on management practices for high-yield, high-profit wheat crops; and methods of providing needed nutrients for corn and oats.

Mr. Peabody says the fertilizer industry can help by: (1) Mentioning and supporting the soil test program in their advertising in the county; (2) Informing their salesmen and dealers about the program and what it can mean to them; and (3) Encouraging salesmen and dealers to attend the monthly industry meetings.

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obituaries

Dr. Leslie G. Boatright, 34, Escambia Chemical Corp. May 12 in a plane explosion, en route South.

Arthur Buist Bryan, 84, retired 12 years ago as the oldest extension editor in the South, at Clemson, S. C., May 15.

Roy Roughton, International Minerals & Chemical, died May 2 of complications resulting from injuries suffered in an auto accident which occurred April 13 near Milwaukee. The midwest district will be covered by IMC Potash Division representatives from other areas on a temporary basis until a permanent replacement is announced.

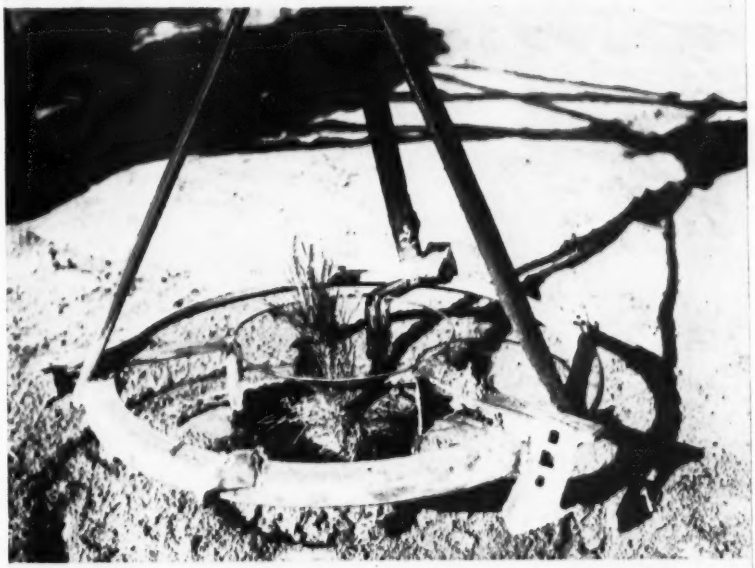
Robert D. Rusch, 51, Chase Bag Company, died of a heart attack May 6 at his home in Chagrin Falls, Ohio.

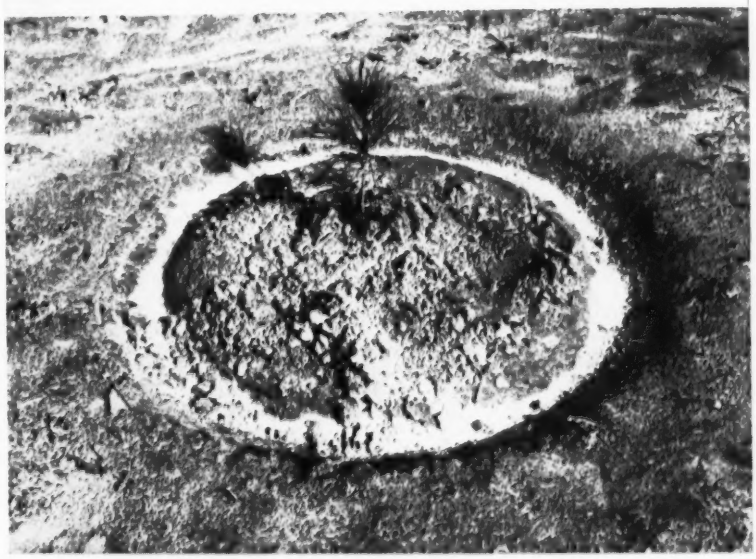
Mass Production Planting Loblolly

Louisiana State University Research workers recently completed initial treatments on 22 acres of Loblolly pine seedlings in new fertilization research projects at the North Hill Farm Experiment Station, Homer. Mr. Dawson Johns, Station Superintendent, said that primary objectives of the studies include (1) determination of levels and combinations of nitrogen, phosphorus and potash that will bring about greatest growth response of Loblolly pine on major North Louisiana Coastal Plain soils, and (2) attempt to establish a basis for estimating nutritional requirements through soil and plant analysis.

Related fertility studies with Loblolly pine are planned for other areas in the state. Treatments include different levels of N, P_2O_5, and K_2O ranging from 0 to 200 lbs. nutrient per acre. Some treatments were applied just before planting, others a few months after planting, and supplemental applications will be made on certain plots in future years.

Soil samples were collected from different depths on each plot for complete chemical analyses. Each plot contains 66 seedlings, and annual measurements will include height, diameter and chemical analyses of foliage and stems. Wood density determinations will be made after the third growing season. Research project workers include Thomas Hansbrough and R. G. Merrifield, Research Foresters, and C. R. Carter, Agronomist.





1. C. R. Carter, Agronomist; R. G. Merrifield, Forester; and Dawson Johns, Superintendent, Homer, Louisiana Experiment Station, with tractor mounted circular cultivating tool developed for Loblolly Pine seeding fertilizer studies at Homer, Louisiana.

* * *

Two laborers face each other on the tractor, one operating the tractor and the other centering the cultivator over the seedlings.

* * *

2. The cultivator makes an inner furrow 6" radius from the seedling, and an outer furrow 12" radius from the seedling.

* * *

3. Phosphate was applied in the inner furrow and covered with soil. Nitrogen and potash in the outer furrow will be covered.

Del-Mar-Va Convention Will Feature Dr. Ralph L. Wehunt

Dr. Ralph L. Wehunt, extension agronomist of the University of Georgia, will be the featured speaker at the Delmarva Peninsula Fertilizer Association Convention according to F. Nash Strudwick, association president.

This meeting will be held in the George Washington Hotel in Ocean City at 10:30 AM, Saturday, June 27.

Ralph Wehunt, born and raised on a Georgia farm, received his doctor's degree in soils from Rutgers University in New York in 1953. He is known for putting enthusiasm into the new Georgia soil fertility program to farmers throughout the South.

Georgia has rapidly stepped up its agricultural research in keeping with industrial growth, and much emphasis is being placed on helping Georgia farmers increase their income by lowering production costs. Dr. Wehunt has demonstrated to rural audiences the practical and economic advantages of using the right amount of fertilizers. His zeal for this program and his ability to transpose this enthusiasm to other people has been a major factor in his success.

Delmarva farmers, fertilizer company fieldmen, bankers, county agents, etc., will be able to consult with Dr. Wehunt during the day for details and questions on the reason of Georgia's success in increasing the profit of their farmers.

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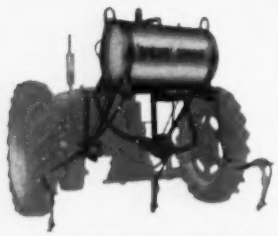

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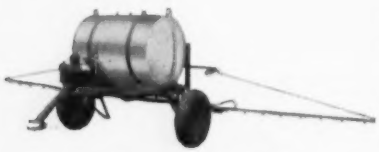

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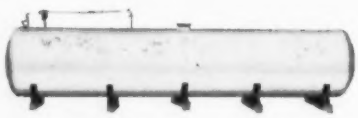

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Potash Deliveries Down 3% For January-March Quarter

Deliveries of potash for agricultural purposes in the United States, Canada, Cuba, Puerto Rico, and Hawaii by the eight principal American producers totaled 898,743 tons of salts containing an equivalent of 523,540 tons K_2O during the first three months of 1959, according to the American Potash Institute. This was a decrease of 3% in salts and 4% in K_2O under the same period in 1958. Continental United States took 495,484 tons K_2O; Canada, 21,433 tons; Cuba, 494 tons; Puerto Rico, 1,500 tons; and Hawaii, 4,629 tons K_2O. Exports to other countries were 59,438 tons K_2O, an increase of 18%.

Deliveries of potash for non-agricultural purposes for the first quarter amounted to 36,116 tons K_2O, an increase of 30% over last year.

Total deliveries for all purposes were 1,055,931 tons of salts containing an equivalent of 619,094 tons K_2O, a decrease of less than 1% in salts and K_2O under the first quarter of 1958.

New Spencer Handbook For Fertilizer Mixers

The 'Spensol Greeen Handbook,' a publication covering all phases of mixed fertilizer manufacture, has been issued by Spencer Chemical Company. The 125-page book is the third in a series of Spensol books which the company has published for use by mixed fertilizer manufacturers.

Covering both granular and non-granular methods of manufacture, the new book includes formulas for the production of all commercial analyses. In addition, basic tables useful in production calculations, plus illustrations of recent innovations in mixed fertilizer manufacturing, are included.

NEW FROM MONSANTO: *Three new products that deliver more value to the farmer, more sales to you and your dealers!*

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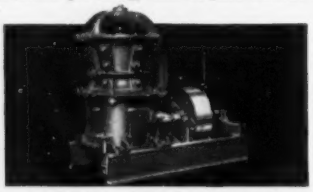
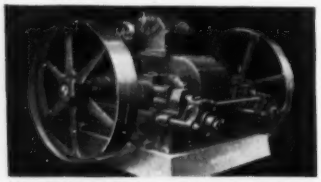
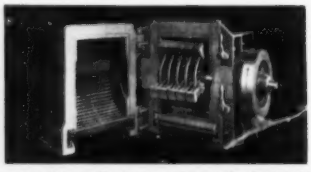
Jaw Crushers — Produce coarse (5 in. largest model) to fine (⅛ in. smallest model). Eight models range from 2 x 6 in. jaw opening (lab model) to 12 x 26 in. Capacities to 30 tph. All except two smallest sizes operate on double cam principle — crush double per energy unit. *Request Bulletin No. 062.*



Rotary Fine Crusher — Reduce soft to medium hard 3 to 8 in. material down to ¼ to 1¼ in. sizes. Capacities up to 30 tph. Smallest model has 6 x 18 in. hopper opening; largest, 10 x 30 in. Non-clogging operation. Single handwheel regulates size. *Request Bulletin No. 063.*



Crushing Rolls — Reduce soft to hard 2 in. and smaller materials to from 12 to 20 mesh with minimum fines. Eight sizes, with rolls from 8 x 5 in. to 38 x 20 in.; rates to 87 tph. Three types — Balanced Rolls; Plain Balanced Rolls; Laboratory Rolls — all may be adjusted in operation. *Request Bulletin No. 065.*



Hammer Mills — Reduce to 20 mesh. Swing-Sledge Mills crush or shred medium hard material up to 70 tph. Hinged-Hammer Pulverizers crush or shred softer material at rates up to 30 tph. Four Swing-Sledge Mills with feed openings from 6 x 5 in. to 20 x 30½ in. Four Hinged-Hammer Pulverizers with feed openings from 12 x 12 in. to 12½ x 24 in. *Request Bulletin No. 084.*

**Reports Manager W. Carleton Merrill concerning Sturtevant Swing-Sledge Mill at James F. Morse Co., Boston.*

STURTEVANT
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N. C. Begins Crackdown On New Law Enforcement

The North Carolina Department of Agriculture reports that there appears to be a lack of understanding of the requirements of the North Carolina Fertilizer Law and the North Carolina Liquid Fertilizer Law on the part of some who are engaged in the bulk distribution of liquid and dry commercial fertilizers.

In an effort to provide some of the requirements most often misunderstood or misinterpreted, they have printed a brief on handling and selling bulk fertilizers, which is available by writing the department.

Distributors of liquid fertilizers must comply not only with the North Carolina Fertilizer Law but also with the Liquid Fertilizer Law. Fertilizer inspectors have been requested to place stop-sales on bulk distribution of commercial fertilizers when they find it being transported without proper labeling, or when they find mixtures of two or more different manufacturers' goods being sold to consumers.

Inspectors were advised to be lenient until June 1 with persons found distributing liquid fertilizers without having obtained from the Weights & Measures Division a contractor's certificate or when they found distributors not providing invoices to the consumer for each and every delivery.

Virginia Grade Committee Holding Annual Hearing

The Virginia Fertilizer Grade Committee will hold a public hearing on June 5, 1959 at Richmond, to give all interested persons the opportunity to express their views or opinions on proposed changes in the present fertilizer grade list.

In preparation for the public hearing, the Grade Committee met with representatives of the Virginia Agricultural Experiment Station, the Virginia Truck Experiment Station, the Farm Organizations, the Fertilizer Industry Advisory Committee and the Virginia Department of Agriculture on May 12, for the purpose of considering changes in the current grade list. The results of this meeting are outlined on a sheet, which shows the grades now in effect and indicates changes the Committee is considering for the year starting July 1, 1959.

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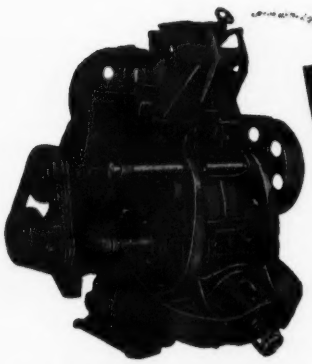

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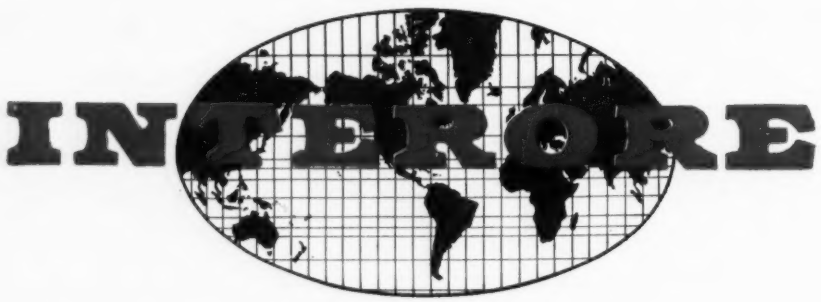
CF Staff—Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperative State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

	April		March		Jan.-Mar. Qtr.		July-December		January-June		YEAR (July-June)	
STATE	1959	1958	1959	1958	1959	1958	1958	1957	1958	1957	1957-58	1956-57
Alabama	-------	263,953*	217,636	184,939	296,745	246,637	199,265	172,721	734,062	808,901	906,783	983,614
Arkansas	95,420	89,621	83,695	48,121	113,772	75,919	64,092	62,752	226,889	265,235	289,641	325,150
Georgia	253,371	262,313	93,991	75,684	175,273	146,308	294,751	269,529	944,618	980,824	1,214,417	1,234,383
Kentucky	-------	99,166*	-------	47,648*	-------	139,541*	98,504	88,771	435,023	444,107	523,794	534,391
Louisiana	56,162	56,239	55,383	46,948	79,260	67,665	64,152	64,192	232,743	200,277	296,935	271,406
Missouri	-------	133,859*	109,907	39,050	165,375	79,445	370,036	335,312	420,615	460,487	755,927	791,830
N. Carolina	-------	414,140*	393,181	279,057	625,933	438,009	228,055	199,466	1,261,685	1,300,353	1,461,131	1,516,587
Oklahoma	-------	15,766*	14,928	9,903	25,801	20,160	68,848	51,436	55,964	52,836	107,400	107,345
S. Carolina	220,685	172,505	242,056	206,229	385,472	286,778	134,202	116,874	615,733	694,571	732,607	817,500
Tennessee	-------	65,668*	101,386	66,080	150,897	84,114	127,116	135,717	307,182	383,457	442,889	524,638
Texas	98,651	100,423	113,146	93,130	203,084	163,525	222,800	213,801	452,327	392,770	666,128	595,176
California	(reports compiled quarterly)				317,589	253,545	450,767	441,969	679,577	663,484	1,123,235	1,079,748
Oregon	(reports compiled quarterly)				-------	-------	50,176	44,793	132,511	138,926	177,304	201,073
Virginia	(reports compiled quarterly)				315,665	218,551	160,178	140,783	549,773	600,158	690,556	754,233
Indiana	(reports compiled semi-annually)						316,260	284,959	795,506	781,268	1,080,465	1,087,185
New Hampshire	(reports compiled semi-annually)						4,746	3,996	16,053	15,730	20,019	18,983
Washington	(reports compiled semi-annually)						75,350	77,498	158,286	110,242	235,784	165,951
TOTAL	704,229	681,101	1,425,309	1,049,141	2,854,866	2,080,656	2,830,794	2,708,565	8,018,547	8,293,626	10,725,015	11,009,193

------- (not yet reported) * Omitted from column total to allow comparison with same period of current year.



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INDEX TO ADVERTISERS

Abbe Engineering Company, Kent Mill Division 73
Allied Chemical Corp., Nitrogen Div. ..... Front Cover, 19-22
American Agricultural Chemical Company, The 9
American Cyanamid Co., Agricultural Div. 11
American Potash & Chemical Corporation 57
Ashcraft-Wilkinson Co. ..... 6, aBck Cover
Atlanta Utility Works 58

Bagpak Division International Paper Co. 37
Baker & Bro., H. J. 78
Bemis Bro. Bag Co. .....
Blaw-Knox Company, Blaw Knox Equipment Division .....
Bonded Scale and Machine Company 77

Chase Bag Company .....
Commercial Solvents Corporation 13
Continental Gin Co., Industrial Div. .....

Davison Chemical Co., Div. W. R. Grace & Co. .....
Doane Agricultural Service 72
Dorr-Oliver, Inc. 12
du Pont De Nemours & Co. (Inc.), E. I. 7
Duval Sulphur and Potash Co. 6

Escambia Chemical Corp. .....

Fertilizer Equipment Sales Corporation 75
Fulton Equipment Company 76

General Metals, Inc. 70
Grand River Chemical Division, Deere & Company .....

Hudson Pulp & Paper Corp. .....

International Minerals & Chemical Corporation .....
Phosphate Division 39-42
Phosphate Minerals Division .....
Potash Division 54-55
International Ore & Fertilizer Corporation 74
International Paper Company, Bagpak Division 37

Kent Mill Division (Abbe Engineering Co.) 73
Kraft Bag Corporation ..... Inside Front Cover

Law & Company 75
Leonard Construction Company 53
Lummus Company, The .....

Marietta Concrete Corp. .....
Monsanto Chemical Co., Inorganic Chemicals Division 71
McIver & Son, Alex M. 73

National Lime and Stone Co., The .....

Ohaus Scale Corporation 73

Phelps Dodge Refining Corporation .....
Phillips Chemical Company 33
Planters Fertilizer & Phosphate Co. 76
Potash Company of America ..... Inside Back Cover

Quaker Oats Company, The (Chemical Div.) 73

Raymond Bag Corporation .....
Renneburg & Sons Co., Edw. 61
Richardson Scale Company 8

Sackett and Sons Co., The A. J. 62, 63
St. Regis Paper Company Multiwall Bag Division .....
Claude B. Schneible Co. 4
Shuey & Co., Inc. 76
Sinclair Petrochemicals, Inc. .....
Smith-Rowland Company .....
Sohio Chemical Company 3
Southwest Potash Corporation 18
Spencer Chemical Co. 34-35
Stedman Foundry & Machine Company, Inc. .....
Sturtevant Mill Co. 72

Tennessee Corporation 48-50
Texaco, Inc. 67
Texas Gulf Sulphur Co. 27
Thomas Alabama Kaolin Company, The 68
Tull Metal & Supply Co., Inc., J. M. .....

Union Bag-Camp Paper Corporation 10
Union Special Machine Co. .....
U. S. Industrial Chemicals Co., Division of National Distillers & Chemical Corporation 47
U. S. Phosphoric Products Division, Tennessee Corp. 48-50
United States Potash Company, Div. United States Borax & Chemical Corp. .....

Wiley & Company, Inc. 75

Yancey & Company, Grady .....

Wiley & Company, Inc.
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Outstanding opportunity for man with experience in Superphosphates and wet process Phosphoric Acid production. Ability to solve customer problems. Must have pleasant, versatile personality and be willing to travel abroad extensively. Languages helpful. Salary commensurate with qualifications. Client assumes fee. Send 2 detailed resumes with letter stating salary desired to: KEY PERSONNEL COUNSEL, Agency, 11 East 44 St., New York 17, N. Y.

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PLANT SUPERINTENDENT desires job, have experience with both dry mix and acidulating plants. Am employed at present. Write Box No. 16, % Commercial Fertilizer, 75 - 3rd St., N.W., Atlanta 8, Ga.

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FOR SALE: Controlling stock in progressive fertilizer company producing up to twenty thousand tons annually. Modern equipment, including granulating. In best farming section of Midwest with minimum competition. Nearby sources of raw materials. Reason for selling: retirement. Write Box 15, % Commercial Fertilizer, 75 Third St., N.W., Atlanta 8, Ga.

FOR SALE—Complete dry fertilizer mixing plant including automatic batcher 25-30 tons per hour. Good condition. Box # 17, % Commercial Fertilizer, 75 - 3rd St., N. W. Atlanta 8, Ga.

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FOR SALE—1 New Stedman Type BX 20 x 18 Hammermill equipped with 4 row rotor with ⅞" manganese hammers and complete with 220V reduced voltage type compensator. Mill direct connected to 20 HP, 1200 RPM, 220/440 Volt, 3 Phase, 60 Cycle Totally Enclosed Fan Cooled Motor. Mill and motor mounted on integral base. Box # 20, % Commercial Fertilizer, 75 - 3rd St., N. W. Atlanta 8, Georgia.

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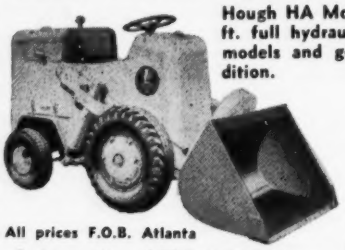

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FOR SALE AT SACRIFICE PRICE: Fertilizer Machinery manufactured by Atlanta Utility Works, consisting of one ton mixer, vibrating screen, clod breakers, elevator chain and buckets, also bagging and batching scales, sewing machine, compressor, belts, motors and switch box. A complete plant ready to run. Call or write, C. Y. Thomason Company, Box 232, Phone OR. 95011, Greenwood, S. C.

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CONVEYOR PRICES INCLUDE BELTING

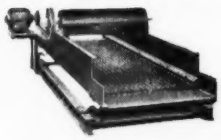
Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2 7/16" diameter shaft.

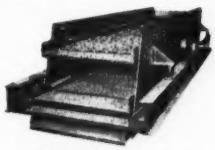
We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN No. 1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN No. 1189 AND PRICES.**

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1397	$ 738	
14"	50'	2222	1159	$16.84
14"	85'	3377	1748	
16"	20'	1262	667	
16"	45'	2137	1118	18.04
16"	60'	2662	1388	
16"	90'	3712	1930	
18"	25'	1477	797	
18"	45'	2217	1182	
18"	70'	3142	1663	19.24
18"	85'	3697	1952	
18"	100'	4252	2240	
18"	130'	5362	2817	
20"	25'	1517	835	
20"	60'	2882	1548	20.37
20"	75'	3467	1854	
20"	90'	4042	2159	
24"	25'	1590	898	
24"	45'	2430	1334	
24"	70'	3480	1878	2178
24"	100'	4740	2532	
24"	120'	5580	2967	
24"	150'	6840	3621	
30"	50'	2911	1617	
30"	70'	3871	2112	24.75
30"	90'	4831	2607	
36"	25'	1818	1118	
36"	45'	2858	1677	27.95
36"	60'	3638	2096	
36"	100'	5718	3214	

BONDED ® GENERAL DUTY AND HEAVY DUTY VIBRATING SCREENS





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PERFECT BALANCE AND SHARP ACTION. Eccentric weight mechanism, spring mounted. 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULLETIN NO. 1086.**

Model Number	Screening Area	No. of Decks	Sale Price
124A	2'x4'	1	$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	688
336A	3'x6'	3	956
138A	3'x8'	1	675
238A	3'x8'	2	815
338A	3'x8'	3	996

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft; 3' x 6' to 5' x 14'. 1 to 5 decks. **WRITE FOR BULLETIN NO. 1087 AND 9 REASONS WHY BONDED IS YOUR BEST BUY.**

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	$1620
436B	3'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	4'x8'	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2400
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

BONDED ® QUALITY BUILT BUCKET ELEVATORS

Enclosed Elevator

Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded's 19 standard models mean lower prices and you get a Custom Built Elevator at no extra cost. Open and other types prices on request. There is a style of bucket for virtually every material or condition; wet or dry, lumpy or fine, granular, slivery, or pellet shapes, hot or chemically active.

Prices listed at right are for Vertical Enclosed Elevators. Standard Elevators with Chain mounted buckets use No. 477 or No. C102B combination chain, 4, 5 and 6 ply, 32 oz. or 35 oz. duck belt is used on Belt mounted Bucket Elevators.

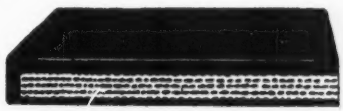
Bonded Bucket Elevators are Jig Built to insure easy Job-Site Installation.

Model No.	Bucket Size Inches	First 20' (Discharge Ht.)	Add or Deduct Per Ft.
Style "A" Spaced Malleable Buckets on Chain			
C53A	5 x 3¾	$1071.50	$20.25
C64A	6 x 4	1088.50	21.00
C85A	8 x 5	1235.00	25.50
C106A	10 x 6	1281.00	27.50
C127A	12 x 7	1510.00	31.25
C148A	14 x 8	1673.00	36.00
Style "A" Spaced Malleable Buckets on Belt			
B53A	5 x 3½	$1099.00	$20.50
B64A	6 x 4	1116.50	21.25
B85A	8 x 5	1311.50	27.25
B106A	10 x 6	1692.50	33.00
B127A	12 x 7	1854.50	37.25
Style "E" Continuous Steel Buckets on Chain			
C85E	8 x 5 x 7¾	$1397.00	$31.25
C126E	12 x 6 x 11¾	1599.00	34.25
C108E	10 x 8 x 11⅝	1604.00	34.75
C128E	12 x 8 x 11⅝	1624.00	35.50
C148E	14 x 8 x 11⅝	1710.00	36.75
Style "E" Continuous Steel Buckets on Belt			
B85E	8 x 5 x 7¾	$1727.50	$34.50
B116E	11 x 6 x 8¾	1839.50	38.75
B128E	12 x 8 x 11⅝	2013.00	43.50

WRITE FOR BULLETIN NO. 1203

TESTED CONVEYOR BELTING* AT NEW LOW PRICES

WE PAY FREIGHT ON 200 POUNDS OR OVER



Major Brand: 12lb to 15lb Average Friction Pull. 800lb to 1000lb Average Cover Tensile. Heavy Duty 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$3.63	$2.83
16"	4	4.08	2.97
18"	4	4.51	3.29
20"	4	4.97	3.80
24"	4	5.85	4.26
30"	4	7.18	5.21
36"	4	8.51	6.18

Major Bee Brand: 16lb to 19lb Average Friction Pull. 2400lb to 3000lb Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$4.31	$3.06
16"	4	4.85	3.46
18"	4	5.39	3.83
20"	4	5.90	4.37
24"	4	6.94	4.94
30"	4	8.53	6.07
36"	4	10.09	7.35
24"	5	8.14	5.78

*All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, plies, duck weights and cover thickness available at low prices. **WRITE FOR SAMPLE AND BULLETIN NO. 1234.**

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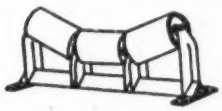

3-roll, 5" diameter Troughing Idlers for:			
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16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50
1-roll, 5" diameter Return Rolls for:			
14" belt	$ 8.50	24" belt	$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

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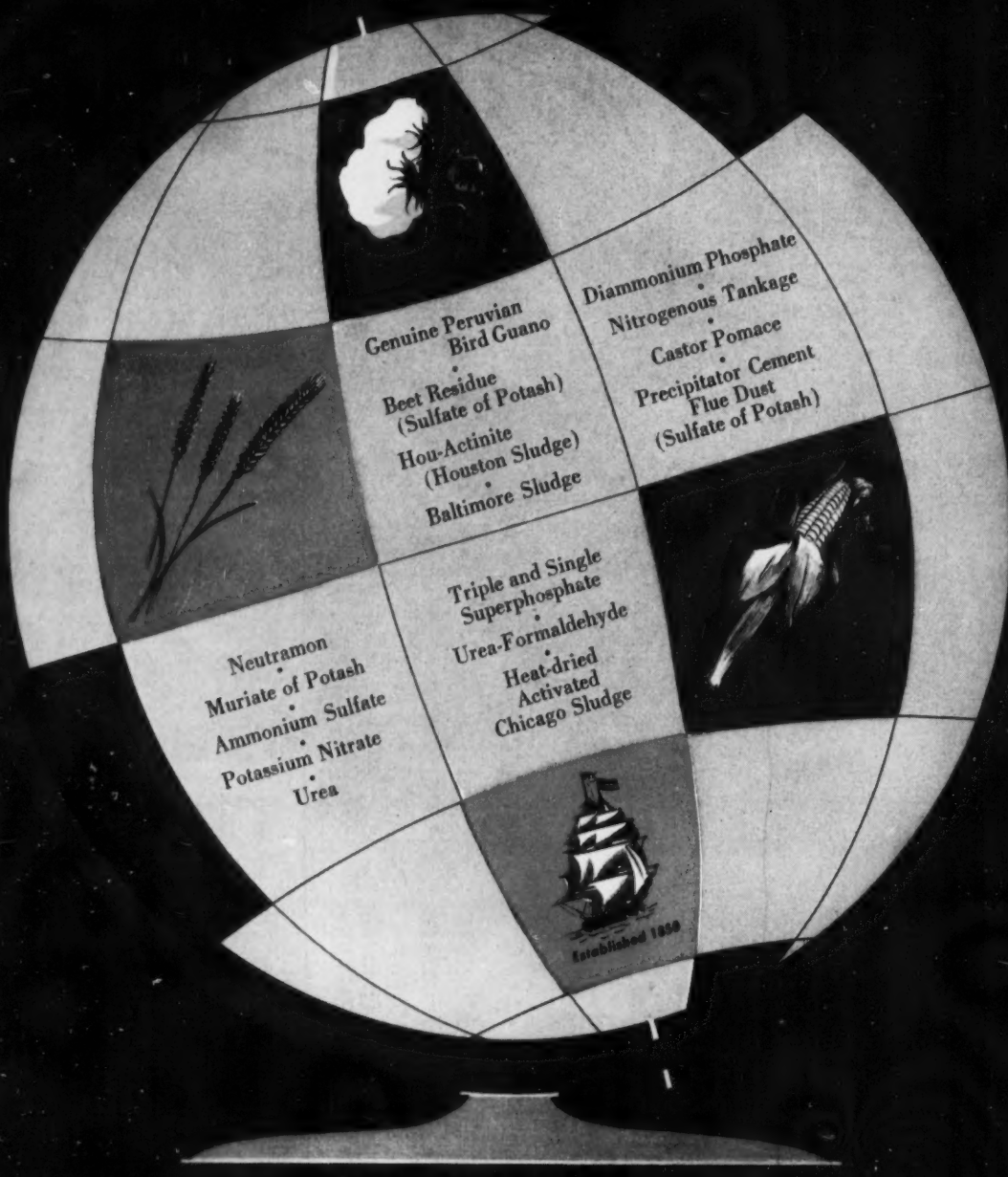

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